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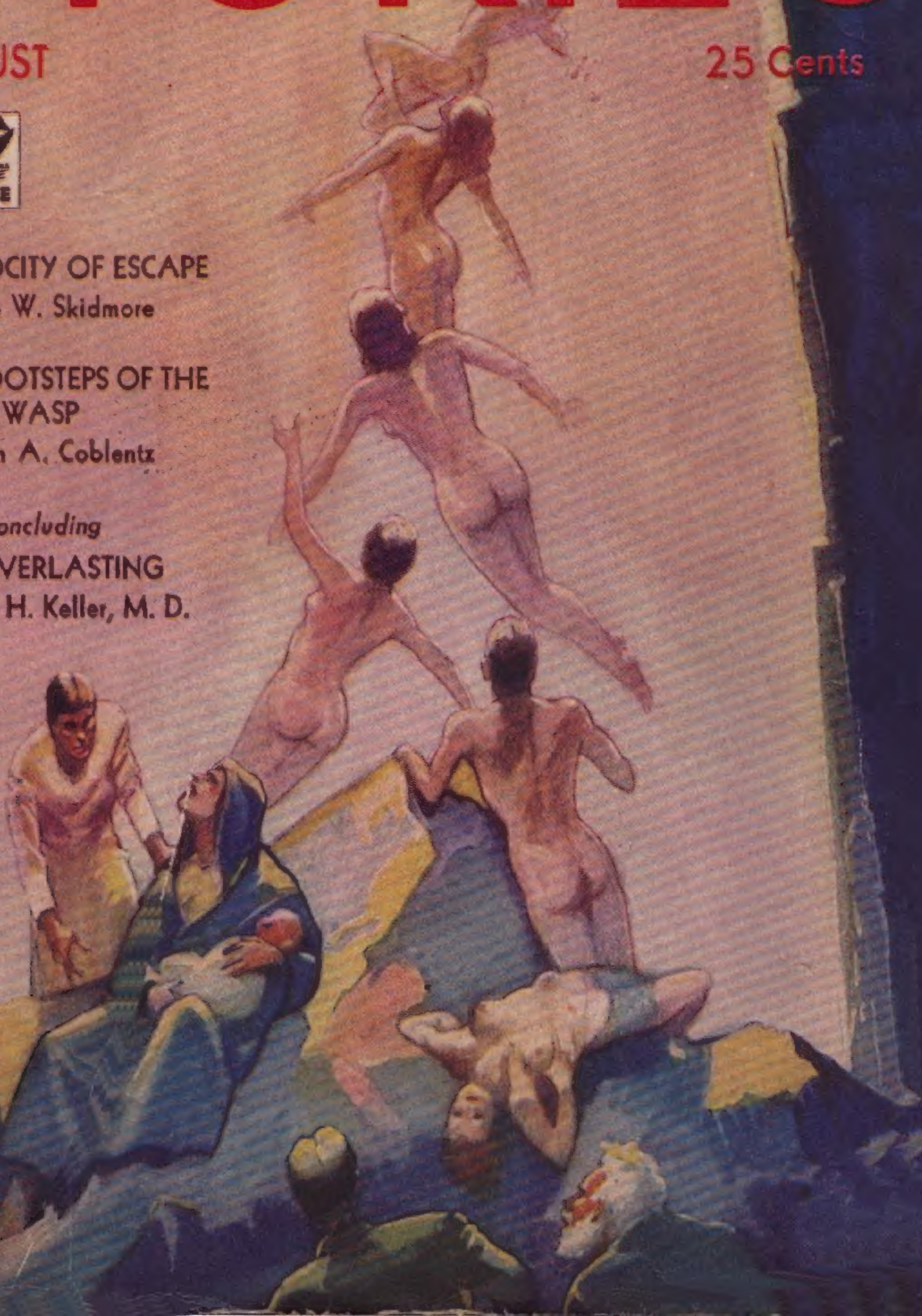

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Science Fiction

Vol. 9 AUGUST, 1934 No. 4

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illustrates the spirit of Dr. Keller's beautiful narration concluded in this issue. We have never published a story with a more enlightened view of the real needs and longings of human nature.
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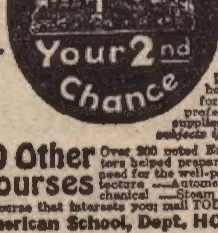

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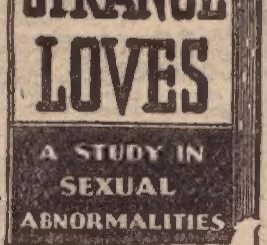

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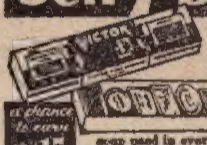

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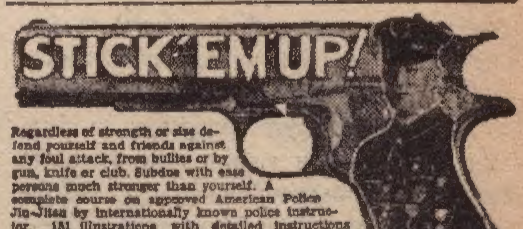

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T. O'CONOR SLOANE, Ph.D., *Editor*

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Extravagant Fiction Today . . . . . Cold Fact Tomorrow

Old-Time Writing—Papyrus and Vellum

By T. O'CONOR SLOANE, Ph.D.

IT is fair to say that the first material used for writing was a smooth surface of stone. Clay too, may have been used, made into a paste and to be subsequently hardened by firing. Tablets with some kind of wax on them were employed for more or less temporary inscriptions and memoranda. Then came papyrus, vellum and paper.

The most ancient inscriptions in characters suggesting writing are what are known as ideographic as far as the Egyptian nation is concerned. These were little pictures of human beings, animals and other objects and they gradually lost much of the pictorial character and developed into a sort of letters. In Asia Minor there originated another type of writing, which seems purely arbitrary in its characters, as much so as our present day letters. This class was formed by combinations of marks each one resembling the cross-section of a wedge and each one of the same size as its neighbor; they were grouped in various ways and the grouping gave them individual values as words or alphabetical characters. These are what are called cuneiform hieroglyphics, the Latin word for a wedge being *cuneus*. The tendency to an alphabet can be traced to Egyptian and Asian inscriptions.

The Egyptian remains became an object of study before the middle of the last century, and it certainly seems that Champollion, the founder of the science, had a very obscure path to follow. His first deciphering goes back to 1821, so we have a little more than a century to look back upon.

The Egyptian hieroglyphs, being definitely pictorial in origin, it would seem that the archæologist who tried to de-

cipher them would have had an insoluble problem, but in 1799 a stone slab, with a three-language inscription was found near the town of Rosetta at the mouth of the Nile, and one of the inscriptions was in Greek. This is the famous Rosetta stone, a heavy piece of basalt, and this ancient monument gave the clew to some of the ancient Eyptian words. One of the inscriptions was in what is called the demotic character, which had lost or outlived the pictorial hieroglyphics. Other such monuments have been found, which have helped in the difficult work. A number of students investigated the subject, among others Thomas Young, one of the most famous physicists of old times, celebrated for his work on the undulatory theory of light and on the interference of light waves. The development of Young's work in physics has had a profound influence on modern astronomy. Yet in his archæological work he only discovered four letters.

The Egyptians made great use of seals. These were made out of stone, often in the shape of beetles and the design or seal was engraved on the flat base under the carving of the body of the insect. These were hieroglyphs. Rubbed over with coloring matter they were used as our rubber stamps are today. It may be taken as the first printing unless the Chinese antedate it with their block printing.

The Egyptians had another type of seal which was engraved on the surface of a small cylinder one-half inch or more in diameter and an inch or more in length and this was used by rolling it on the surface to be inscribed after the cylinder had been coated with a coloring pigment. Here the Egyptians really seemed to be ahead of us, as it is fair to say that this is the first attempt at printing from a cylinder, and to-day cylinder printing presses turn out newspapers at the rate of many thousands per hour from a single complicated machine.

It would seem that the cylindrical seal of the Egyptians could be modified so as to be used for rubber stamps. The rolling motion would be particularly effective as the pressure would be on such a small element of the cylinder at a time that a very excellent impression could be looked for. Rubber stamp printing is relief printing—the old Egyptian seals probably may be called intaglio printers.

One of the most characteristic plants of Egypt is the papyrus. This is a large reed which grows to a height of ten feet and whose interior consists of a very strong pith. Centuries before it occurred to anybody to make paper, this pith used to be divided by cutting into very thin slices, which were placed together, the sides having been cut very true, so as to give a very close joint and they were crossed by other strips similarly cut, so that the finished product was two layers thick. How they were made to adhere is not perfectly clear—whether there was some mucilaginous or other adhesive natural sap in them, which held them together, or whether some additional adhesive was used, is not known.

The stems as thick as a man's arm at the base, are triangular with an outer shell or bark. Within is the pith. This is white and very strong. It can be cut into slices of various thicknesses as desired. So strong is it that boats can be built with it. Moses' mother, Jochebed, in her despair at the legally imposed slaughter of the male children of the Hebrews, put the infant Moses into what has been called an "arc of bulrushes," which was a little box made of papyrus, and set the little creature adrift on the Nile. We read of larger papyrus-built craft, but this little vessel carried a more impressive load than any of them.

The area where it was cultivated was much larger than the region it now grows in. Its "cultivation" may have better deserved the name of "conservation." The manufacture of papyrus for literary work was carried on for many centuries. It is said that it is still made in Syracuse.

The material is so strong and amenable to shaping that it was often used for mummy cases. From these, by careful treatment and straightening, papyri have been recovered. Papyrus has also been found in Herculaneum, as rolled-up documents, charred in the destruction of the city, which have been unrolled and preserved.

The world to-day, is developing a mania for collecting. Fabulous prices are paid for different objects of the virtuoso's fashion—it may be an almost unique postage stamp or a first edition of a book of no particular literary value and it would be quite curious if one could make up a list of the "fads" of collectors. And now comes the sad part of all this. Papyrus was very enduring, far more so than our modern news-press paper, and buried in ancient ground in Egypt and elsewhere, there were quantities of papyrus manuscripts, which were well worth the attention of the world. It is hard to believe that it was not until the year 1870 or thereabouts that collectors of the highest class and students of Egyptology and ancient literature including Greek and Latin, awoke to the fact that there were quantities of papyri still to be had in a good state of preservation although centuries old. They were perhaps buried in the ruins of a building and after preservation for twenty centuries or more were rapidly disappearing, not by the forces of nature, but by the ignorance of man. Thus we are told of one instance where a number of papyri were found by the ignorant Arabs in a compact roll, and they amused themselves by burning them on account of what they thought was the pleasant odor which they produced, and of the entire roll one was fortunately saved.

The searching for papyri is now being systematically conducted by scientific organizations. The rather primitive inhabitants of some of the regions, where excavations are being made, have awakened to the fact that papyri have a market value, and we are told of their "robbing the grave" in a sense, by carrying on private excavations of their own in competition with the governmental and university investigators.

If anyone will go to a public libary and see the condition to which the paper on which newspapers are printed reverts after a few years, he will acquire a great respect for papyrus.

Therefore, when we read of Moses and the bulrushes, it is papyrus we should be thinking of, the plant cut up and made into a little boat carrying the infant who was to be the writer and exponent of the law for mankind. And the Pentateuch, the first five books of the Bible, were probably written on papyrus.

The last sixty years have brought to light a quantity of papyrus manuscripts, which have been buried for centuries, showing the great endurance of the paper of the ancient world as we may call it and the good quality of the ink with which the words were written. The ancient literature thus far recovered has little literary value. If the lost books of Livys history could be found in the quest, the world would be awakened in earnest.

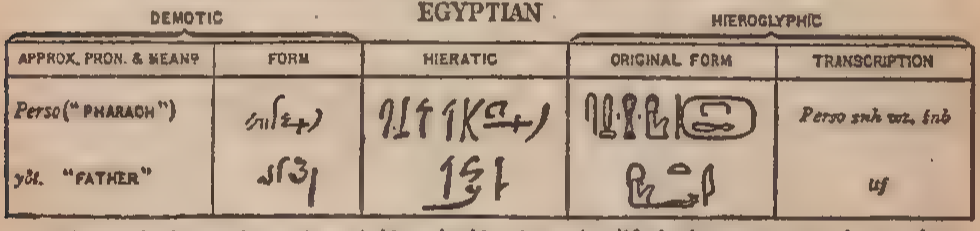
In connection with paper made almost directly from vegetable matter, bark cloth or tapa should be mentioned. This is made from the bark of several kinds of trees, the outer bark being removed and the inner bark beaten out with mallets. This is done in Africa and in the islands of the Pa-

cific and very beautiful results are attained. It might be called paper, but was never used for writing because the people who made it had no written language. Very interesting ornamental patterns were painted upon it, one of the many examples of the fondness of mankind for decoration.

Parchment is made from the skin of very young animals, sheep, goats, and calves. The name vellum applies to the finest kind of parchment, for some of the latter is far from smooth and is somewhat dark in color. The manufacture of vellum starts with the skin of fine quality and thin. Washing, liming, dehairing, scraping and paring, repeated as often as necessary in each case, gives the final product. About the year 200 A. D. parchment began to make itself felt as a rival to papyrus. One great effort was to make it thin. The color of the two sides differed, one from the other, so the custom obtained of putting hair side to hair side and the lighter colored, inner sides next to and facing each other.

Here a curious thing may be noted. Papyrus was a definite width before being made up; in wide or narrow pieces. Parchment was completely sheeted and in single pieces from the beginning. But modern man when he makes paper first reduces the material to the finest shreds, almost to dust, wet or dry, and then felts it together to an enormous area. Papyrus was made up into rolls also, sometimes of many feet in length, but never of size to compare with rolls of paper of the present time.

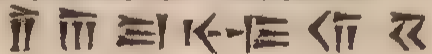
EXAMPLES OF CUNEIFORM WRITING



The gradual transformation of hieroglyphics into simplified characters are shown above, where the name of "Pharaoh" of Egypt and the word "father" are inscribed in the original almost pictorial forms (on the right), which were gradually changed to the demotic characters approximating to handwriting. The word "demotic" is from the Greek and expresses or suggests "simplification" or "popular."

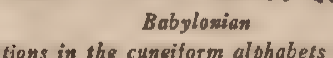
The philologist, W. D. Whitney, gives this statement concerning demotic characters:

"The demotic has lost all relics of a pictorial character, being composed of a limited, though large and unwieldy, number of arbitrary signs, chiefly phonetic."



Persian

Susian



Babylonian

These cuneiform inscriptions in the cuneiform alphabets of three regions give the name of Darius the Great, the king of Persia. A number of bilingual and trilingual inscriptions have been discovered; the above is trilingual. The ones illustrated go back to the era of "Darius great and good," as the poet Dryden terms him, to between 600 B. C. and 500 B. C. They are from a very famous rock inscription at Behistun in Persia. A limestone mountain rises to the height of 1700 feet, and on its face at a height of 300 feet from the ground is the famous inscription in the three languages shown in the illustration. The inscription tells of some of the achievements of Darius. The little notch in the wide end of the wedge is supposed to have originated with the use of the metal stylus, on soft clay, which was afterward fired.

Life Everlasting

By DAVID H. KELLER, M.D.

Conclusion

The second part of the story promises to hold the reader's interest to the very end, and it would be interesting to know how many will have guessed what the conclusion of the story is to be. There is a very important moral in the narration, a good bit of psychology, and human nature comes out on top, for the author never lets his readers be disappointed in this regard. He is a great believer in mankind.

Illustrated by MOREY

What Has Gone Before:

We are told of an altruistic scientist who has discovered a serum which seems to be a cure for "the thousand natural shocks that the flesh is heir to." The serum not only removes bodily infirmities, but gives a new cast to the mind as well as new life to the body. A poor rooming house affords him admirable subjects for his experiments, and the owner of a tabloid paper, who has a crippled son, is deeply interested in his work and has his son also treated. The result is amazing, a cripple is cured of his infirmities, the morale of others is changed. The tabloid expects to make a great hit when permitted to publish the story, but which for the present is to be kept a dead secret. The inventor, who is the hero of the story, after all these results, which include the curing of some fourteen hundred prisoners in Farview Prison in Ohio, meets the President of the United States and his cabinet. We now will read of the results of the discussion at this important meeting, what was done, and the second and concluding instalment will tell us the rest. It bids fair to hold us in suspense to the very end.

"GENTLEMEN, I am giving you a secret which, unless something is done soon, will no longer be a secret. Grant died of cancer, Cleveland was operated on for cancer, and I have been treated by radium for over a year for cancer. It has been a discouraging year. A week ago my medical advisers told me that at the most I will die in six months. At Farview I saw a case similar to mine, a patient who was considered to be completely cured thirty days after he received one dose of the serum.

"You are all sick men. I am not asking you to give the diagnosis. This is going to be a gift to you and not a cold-blooded experiment. You know what is wrong and you will know if you are benefited. I am suffering from cancer and I am going to ask Mr. Biddle to give me the first injection. I am going to have him give it to me in front of all of you. There will not be, as far as we are concerned, any secrecy. After I am treated I am going to have a dose given to my dear friend, the Vice President. After that the line forms on the left. You can take it or leave it. Think it over, talk it over, come to a decision. All I ask of you is a gentleman's promise of secrecy. It will not help the stock market to know that I have cancer and that the Vice President has angina pectoris and may die at any moment. Mr. Biddle, will you proceed? Which arm?"

There was an air of resistance in the group. Whisperings of disapproval and negativism. Ignorance of medical mat-

On the little steamer chugged between high, precipitous cliffs of Laurentian granite, till at last, a thousand feet above them, to the left, they saw a Madonna holding in her arms the Christ Child.

ters made the average man fear the procedure. The thought of allowing an unknown drug to be introduced into the veins was a difficult one to face. Biddle had given the serum to the President and Vice President and no one stepped forward to be the third patient. Suddenly a little dog walked slowly up to the table leading a blind man. The dog was a seeing friend; the man, Goresome, the sightless leader of Montana.

"Was there a blind man among those convicts?" he asked.

"There was," Biddle answered.

"What happened to him?"

"I will answer that," interrupted the President. "I saw the man. I talked with the eye specialist who studied his case. He had perfect vision by the end of twenty days."

"That is enough," replied Goresome. "This little guide of mine kept urging me to move. For twelve years he has guided me and not made one mistake. I was born blind. I would like to see the sunshine before I die. Give me the needle."

"No man from the West has any more courage than a New Yorker," exclaimed a Senator from that State. "I have been only half a man since I had my stroke. I want to be the next man after Goresome."

That started a general movement. At the end only six men remained untreated. Silent, critical, cool, determined, they refused to be swayed by the group movement.

"Come back to Washington at the end of thirty days, gentlemen," concluded the President, "and let us at that time determine what is best for the Nation."

"ONE minute, Mr. President," shouted one of the untreated six. "What does Mr. Biddle get out of this?"

"You answer that, Mr. Biddle," whispered the President.

"Nothing!" said Biddle. "If the serum is of any value, I am willing to give it to the nation."

"Why are you doing this?"

"I have a sick son."

"Have you given him the serum? Have you taken it yourself?"

"The answer to both questions is NO."

"Why?"

"I do not care to discuss that. It is personal."

"Are you sure you know what the serum will do?"

"No."

"What do you mean by that?"

"I mean that I am not sure of all it will do. I only know a part of its power."

"Be honest with us. You say it makes the blind see, the criminal an honest man, it cures cancer, heart disease, and every disease man can have. You admit that. If it can do all that, what else can it be asked to do? What other powers do you think it might have?"

"I do not know."

"Have you any suspicions?"

"Yes; but I will not say what they are. Anything else?"

"No. You have said enough."

"Just one word more, gentlemen," said the President. "If Congress, in the special session, passes the legislation I will ask for, Mr. Biddle has promised to address a joint session of the Senate and the House and at that time explain the theory of the serum and give the formula to a selected group of scientists and physicians. He tells me that it is easily and cheaply made. He assures me that he wishes to make a gift of it to the nation. But he feels that its general use must be safeguarded by wise and effective laws. I want to thank those of you who have helped me by personally giving Mr. Biddle a chance to demonstrate the merits of his serum. I am not in any way blaming the six

gentlemen who refused to experiment with an unknown drug. Good night and good luck to all of you."

CHAPTER X

The Six Conspirators

THE six who had refused to take the serum that night met in a Baltimore hotel. It would be interesting, if it could be written into the record, that these six were powerful but corrupt politicians, that they were the recipients of large sums from the racketeers of the underworld, that they saw in the serum of Biddle the destruction of all forms of vice. But such was not the case.

The six men were clean-cut, respectable, hard-headed business men, who considered political office simply as a necessary adjunct to their business. They were the majority stockholders in some of the largest corporations in the United States, and their main interests were life insurance, accident insurance, drug manufacturing, bonding, hospitals, and the higher education of the youth of America. One of them was the president of a large university.

The reason for the meeting was not too much disbelief in the experiments of Biddle but too great a belief. They saw, perhaps more clearly than any other six men in America, what the general use of his serum would result in. They sat around a table with their coats off and their shirt sleeves rolled up. They wanted to think.

The university man started the discussion:

"I will imagine that I represent the higher education, not only of one university, but of the nation. The income on our endowments pays much of our expenses. That money is invested mainly in life insurance companies and railroads. The railroads have been hard hit. If the life insurance companies collapse, every college in America will have to close. There would hardly be enough money to pay the janitors, let alone the professors. I am not going to do your thinking for you, but I am going to ask each of you to imagine what effect the general use of the Biddle Serum will have on the business of the life insurance companies! Also the companies who are doing accident insurance!

"And here is the second thing I ask you to think about. What two departments of every university are the best attended, after the plain A.B. or B.S. groups? The answer is law and medicine. Why do our young men study law and medicine? Because they expect to make a living. Now, one more question. Suppose the Biddle serum works the way the inventor thinks it will? What will happen to the practice of law and medicine?

"I do not like to admit it, but the practice of law depends on the weaknesses of men's souls and the practice of medicine depends on the weaknesses of their bodies. That must be evident to all of us. There are over one hundred and twenty-five million persons in the United States and every day millions of them break some law and have to have the help of lawyers, and every day millions of them break some law of health and have to appeal to the medical profession. I tell you that thirty days after the Biddle Serum is given to all of these people the income of these two professions will cease and the lawyers and doctors will be on the streets selling apples and holding out the tincups for sweet charity. No one will want to be a student of these professions. Our law and medical schools will close their doors. Who will want to study medicine for ten years, at a cost of fifteen thousand dollars, when any disease can be cured by a single injection of a simple serum that can be made by the

barrel by any manufacturing chemist! The millions invested in our hospitals will not yield one cent of income; every drug company in America will go out of business over night. There will be no more surgical instruments sold. It looks bad to me."

The other five remained in stolid, stodgy silence. At last Winston Manning almost cracked the spell of quiet thinking. He had been Secretary of the Treasury under a former President. He was said to be one of the ten richest men in America.

"I guess that is all true. At least, the conclusions are correct, once the premises are granted. There is another thing that is disturbing me more than the tottering of our universities.

"OUR Government is essentially one that is ruled by the Classes for the Masses. It is highly political. Ever since it was founded the Common People have supported it in taxes and the rulers have lived on those taxes. At times the farmer, the little laborer, the poor, white-collar man have had a hard time to get along, but, so far, they have not done much, because they have had no great and outstanding leadership. If they had the right kind of leaders, they would tear the present political machinery to pieces and out of the ruins they would build a government that was sympathetic with the under man, the forgotten man, who does little except work like a dog, live as best he can and pay taxes.

"Keep that in mind. For the time forget the cases of cancer and blindness and kidney disease that are said to have been cured by the Biddle Serum. Think what it has done to the souls of the people who have taken that serum; think of the changes it has made in their personality. Take the case of the taxi dancer in New York City. Of course, *The Purple Flash* did not give her right name, but I am sure the facts concerning her are absolutely true. Then, consider the reports of the psychologists and sociologists who studied those fourteen hundred convicts in Farview Prison. Take the simple statement of the hard-boiled Warden. Take the strong words he gave to the press: *'I have known many of these men for years. Since the giving of the serum they have changed so for the better that I would trust any of them in any way. I am seriously considering approaching the Governor of Ohio with the suggestion that these men be released from prison and given one more chance to rehabilitate themselves.'* Does it not seem that in some way this serum enables men to think more clearly, to live more cleanly, to follow more accurately the teaching of the Golden Rule?

"To-day you saw over a hundred of the leading politicians in the United States step up and take that serum. I know those men. You know them Outside of Welfare Watkins, who is an emotional, idealistic, asinine sort of a person, I would not trust one of that bunch with a five-cent piece. They would take the pennies from a dead man's eyes and rob a starving infant of his bottle of milk. They have had charge of the Government Cow for years and they have milked that cow dry. They know every trick to deceive and rob the public. And in their way they are as criminal as the men of Farview ever dreamed of being, only they were too smart to be caught.

"They took the serum. The President was smart. He wants to come up for another term. He thinks that if he gives the populace free health, they will vote for him. He never said a word to those men about curing their souls, but he was very anxious to give them healthy bodies, so they could repay him

with their gratitude. Perhaps they will. He may have overlooked what the damned drug would do to their souls. But I tell you this. If the serum works on those politicians in the same way it worked on those criminals, they will come back to Congress representing the common people and having the interests of the forgotten man at heart and at the next election both the Democratic and the Republican party will be killed, and the country will cease to have a political rule but will be governed solely in the interests of the people. And that will mean the death of every large corporation in America. Laugh about that if you can."

Again the sextette remained silent. At last a Bishop broke the silence. He was a combination of Priest and Politician, and once had swayed a national election by an appeal to religious prejudice.

"Biddle knows more about this serum than he is telling," the clergyman whispered. "You have talked about the fall of universities and of political parties, but there is something more serious. Suppose he is right in his claim of being able to cure the bodies of mankind? Suppose the sick become well and the well stay well? How are people going to die? Are they going to die? What is going to happen if they don't die? Every religion in the world is based on the fear and hope of eternity, the fear of Hell and the hope of Paradise. But how can there be a future if there is no end to the present?

"Our religious life will smash, our churches close, the contributions to the support of the clergy come to an end."

"You take it too seriously, Bishop," laughed the university president. "Biddle never said he could give the people immortality. He does not think so and no one else thinks so."

"I know he did not say so," argued the Bishop, "but he did say that he was not sure of just what power the serum held. Even suppose that death does come. His serum robs the world of sin and I cannot see how the Church would function were it not for sin. I understand his subconscious thought, and it is one I have had to combat for years; the idea that there is no sin, only disease, and that all crimes are simply symptoms of an abnormal body or mind —that if the disease could be discovered and cured, the symptoms would disappear and the patient would cease to be a criminal. I have had an army physician argue that a cocaine fiend was simply a sick man, just like a victim of typhoid fever. Now, if all wickedness in the world can be done away with just by giving every person a dose of the Biddle Serum, what is going to be the future of my church? And every other church?"

"IT is growing late," growled one of the men. "What is the answer? We cannot get anywhere by talking about the immortality of the soul and the philosophy of crime and religion. What are we going to do about it?"

"We have to see Biddle and buy the secret of the serum from him!" demanded the Bishop.

"Suppose he won't sell?"

"He will if we find out his price."

"But he may be honest."

"Then there is only one thing to do," sighed the university professor. "We will talk to him kindly. We will show him where he is wrong. We will persuade him that the best thing is to form a company for the manufacture and distribution of the drug. We will tell him that he can be president of the company. Tell him anything. Pay him anything he asks. Money, power, reputation, a trip to Europe to demonstrate the drug.

"We will do that little thing. If he refuses to listen to us, we will have to take him out for a ride!"

"Why Professor!!" exclaimed the politician.

"And," continued the president of a noted university, "Congress can then meet. The blind Goresome may see, our beloved President may be cured of his cancer. They will wait, but they will wait in vain for the arrival of Biddle, the philanthropic inventor of the cureall serum. There will be a lot of talk, and then the people will laugh and call it one of the greatest bluffs of the age and say that Barnum died too soon, but left worthy followers in Welfare Jones and our great President."

And that was the final decision of the six conspirators.

CHAPTER XI

Fate Intervenes

THE six lost no time in making contact. It was thought best to have the negotiations opened by the Bishop. He went to Philadelphia, located Biddle and called on him in his laboratory. His name, his position in society made the door to the scientist's office open rather easily, in spite of the fact that the man and every move he made was carefully guarded by Secret Service Men. The President did not want anything to happen to the maker of the serum.

The Bishop thought he knew his man. He had an idea that honesty would be the best policy; at least sufficient honesty to convince his listener that he was honest. So, without loss of a second, he opened the conversation:

"Mr. Biddle. I represent five other men besides myself. When I name those five you will recognize them as being leaders in everything that is traditionally great in America. They stand for culture, education, stability, and the best things of life. We have met and given serious consideration to your discovery. We believe in you, and the value of your serum. But we are not convinced that the plan of the President of the United States is the wisest and best one. To our mind, there are several objections. As I understand it, you propose to make this medicine available to every one, rich and poor, wise and ignorant, irrespective of color. Am I right?"

"I really do not know. It may be that there will be some restrictions. That is up to Congress."

"Would it not be better to have at least an educational limit? You are giving unlimited health to the world; would it be wise to give it to all? Should it not be limited to those who can use and appreciate such a blessing?"

"You think that to those who have shall be given and those who have little shall lose their all?"

"Not exactly."

"Then what do you think?"

"Just this. The man who receives your serum will be endowed with wonderful health. He will have a great advantage over his fellows. Now, to use that advantage to the greatest good, he should have a corresponding intelligence, be of a good family, have a background of culture. Your experiment with the criminals was all right as an experiment, but we cannot approve of it as routine practice. Do you intend to restore healthy bodies to the underworld? the insane? the mentally defective? and turn them loose on society to continue to be a burden, and an additional one because of their vigorous bodies?"

"I HOPED that there would be a change in their minds."

"That is impossible. Can a leopard change his spots?"

"Perhaps not. At least, even with his spots he will be a happier leopard if he is a healthy one."

"All right. But how about Europe? Asia? Those nations owe us millions, even billions of dollars. Are you going to give them universal health? I feel that they are waiting for the time to come when they can crush us. If you make a public announcement of the formula, every country in Europe will start making the serum at once."

"It will be a fine thing for their sick."

"Oh! I admit that, but think of our country! Would it not be better to keep the formula a secret and sell them the drug? If you do not want to profit, let a corporation be formed with a large percentage of profits going to the Government. That would lower taxes, and, at the same time, keep the secret as a national possession. Would you do that?"

"No."

"Will you sell it to us?"

"No."

"What is your price?"

"I have none."

"What do you want? Wealth? Power? Fame? Office? Name it. We are in a position to give you anything you ask for if you go in with us."

"I do not want anything."

"One more question. Why did you want to make a serum like this?"

"I have a son."

"Have you given him the serum?"

"No. Now Bishop, I feel that we understand each other. My time is valuable. Will you excuse me?"

"Five hundred million?"

"Go. If you do not, I will have to have you removed."

The Bishop left.

BIDDLE sat down and, in long hand, wrote a confidential report of the entire conversation and sent it to the President. He felt it was important. So did the President.

The Bishop went back to the powerful five.

"I know a man," said the politician, "who can do this little thing for us. He takes pride in his special abilities. Of course his price for Biddle would be high. The inventor has become a national personage. But this man would do it for a million."

"Put him to work," said the Bishop. "I hope he has better luck than I had."

That night a sleek, little man, nicely dressed and carefully manicured, called, by invitation, to see a powerful politician. He listened to the man's story.

"A million is a lot of cash," he at last commented, "and this guy Biddle is worth it, and maybe more. It can be done; but I do not want to take all the grief. Who is back of this?"

"Do you have to know?"

"I should. I want to feel sure that they have power enough to take care of me. The matter need not be talked about. Just have a supper in a quiet place and invite me. I know most of the big guys, and then, after I have a chance to look them over, I will give you my answer and my price."

"I am not sure they would come."

"Then I am sure I won't do it."

"I'll see them."

"Better make it to-night, and get a quiet place, and a back room. How about meeting at 'Tony's Place' down on the Avenue? He is a friend of mine and knows how to keep him mouth shut. Ten to-night, and the six of you had better be there."

Seven men sat around a small table at 'Tony's Place' that night. Six of them ate little and talked less. The sleek little man ate and talked for the rest. At last he wiped his mouth.

"You want me to take this man Biddle for a ride?"

"Something like that," whispered the politician.

"How about two million?"

"We will pay it in coin," said the University President. "No bank notes and no checks and no publicity."

"O. K. with me. But, with your education, you ought to know that two million in coin is a lot of metal. You had better arrange to give it to me in negotiable government bonds. Suppose one of you meets me here to-morrow night with them? I'll be going now. I don't want to be seen leaving here with you. I have a reputation to preserve."

He went out of the room. Ten minutes later the six men left 'Tony's Place.' On the sidewalk they were greeted by a blast of machine bullets. They were dead before they knew what had happened to them; dead before the auto with the closed curtains was a block away.

CHAPTER XII

Biddle Has a Caller

TWO days after this Biddle had a visitor. None other than the President of the United States. He came without notice and so secretly that his arrival in Philadelphia did not receive the attention of the papers, until he was ready to return to Washington. He asked for a private interview with the inventor.

"I received your letter," he said to the scientist. "In a way I was not surprised. Those six men have been persistent in their efforts to block every effort of mine to have legislation passed that would in any way be of benefit to the people. They were intelligent and felt that they had a sacred trust, and that was the preservation of Special Interests. They felt that in some way the general use of your serum would be injurious to the various corporations they represented. In refusing to take the serum themselves they paid you a high compliment. They evidently wanted to go the limit in blocking any plan leading to its general use. Have you seen the papers?"

"I have not seen a paper for four days. I have been busy working out my plans for the manufacture of the serum in bulk."

"Then, you do not know what happened to the six?"

"Oh! That? Yes, I heard about it."

"Did you have anything to do with it? I know that is a hard question for you to answer, but I must know. Their antagonism to my future plans must be known, and their being killed in front of a New York speakeasy has already raised all kinds of gossip. I feel that the Administration can weather the storm, but I should like to know the facts. Would you mind giving them to me?"

"You do not think I killed them?"

"No. You do not impress me as a gangster and the crime was that kind of a murder. But you had every reason to fear them, and I feel sure they intended some harm to you. Probably not murder, but certainly kidnapping, or blackmail. As soon as I received your letter I made arrangements for your protection, but, evidently it was not necessary."

"No. It was all taken care of."

"Do you know how it was done? Who did it?"

"Yes, but just within the last two hours. In fact, I just said good-bye to the source of my information about thirty minutes before you arrived. My visitor was none other than Silent Sincox. Perhaps you have heard of him? He is a rather powerful force in the various rackets of New York. He came to see me.

"Life, Mr. President, is a rather

peculiar thing. Millions of people, acting and interacting and reacting on each other. Millions who are swayed this way and that way by the tides of life, with no clear perception of where they are going or why they are going or why they are doing what they are doing.

"Something of all this happened in regard to our six leaders. When they found they could not bribe me, they decided to kill me. I suppose they had the right idea, and I am not sure that we can blame them. They were a little careful in the way they went at it; at least they secured the services of a man who was never known to double-cross a customer and who never failed to earn the price of taking a man for a ride. He was so clever that the police so far have absolutely failed to pin a single murder on him. Of all the killers in America they could not have selected one who was more to be trusted in a matter like that.

"But Silent Sincox did not come from Italy. He came from Shamokin, Pa., and his right name was Peter Casey. He had a sister he loved dearly. Her name was Mary. He tried to make her behave, but he made a failure of it. She came to New York, changed her name to Valencia Moore and was one of my first cases. The serum made a rather remarkable change in her morals. The case was one of those detailed in the *Purple Flash,* but the name was changed. Of course, the brother knew of the change. He knew that in some way I was the one who was responsible for it. Rather a coincidence, was it not?"

"YOU would think that was enough. But it was not the only odd feature of this story. Silent Sincox had a friend, a boy he had known since childhood. The friend committed murder, was caught redhanded and sentenced to life imprisonment in Farview Prison. Sincox used to go and visit him. He was dying from tuberculosis. Death was just around the corner. He was one of the convicts who received the first injection. Sincox knew about that. He was not sure of my name, but he made it his business to do something for me. He told me that his first thought was to buy me a diamond ring. That was coincidence, number two.

"Now, of all the killers in America, these six men had to go to this man and ask him to kill a person by the name of Biddle. He knew there was more than one Biddle; so, he did a little stalling and learned that the specific Biddle he was being hired to kill, was the man who had reformed his sister and cured his friend. He arranged matters, met the six men, walked out of the speak-easy ahead of them, gave the signal to his helpers, and that was all there was to it. There was no way at all to show that he was at all connected with the murder. He paid all the expenses and the men who did it are now on their way to Italy in a private seaplane.

"But he felt that I ought to know about it. If some men wanted to kill me, there might be others. He wanted me to be on my guard. So, he called on me, and told me the story. He will never kill another man."

"How do you know?"

"I gave him a dose of serum just before he left."

CHAPTER XIII

The President's Message

THE Senate Chamber was filled with Senators and Representatives. The visitors' galleries were jammed with the aristocracy of America and Ambassadors and Ministers from foreign lands. The press-boxes were filled to overflowing. The President personally was going to open

the special session of Congress and read his message.

The Chamber rocked with applause as he walked in, followed by his Cabinet and Governors from over three-quarters of the States. When the applause died away to silence he began to read:

"To the Senators and Representatives of the Congress of the United States.

"I have Asked you to Meet in Special Session to Consider a Matter of Vital Importance to the Interests and Welfare of Every Citizen of This Country.

"At a time when the economic foundations of our country are being shaken, when the deficit is growing and in spite of all our efforts to balance the budget the nation is rapidly falling in bankruptcy and no system of taxation appears possible, new hope is given us by a scientific discovery that may be of such value that it will revive our entire economy and make us again a prosperous and happy people.

"I refer, as you probably know, to the discovery of a serum by a scientist named Biddle. This serum has been given to five persons in New York City, to over fourteen hundred convicts in Farview Prison, Ohio, and, lastly, to over one hundred of the leading officials of this county, including your President and Vice President.

"In every case the giving of the serum has been attended with changes so decisive; so far reaching in the healing of disease and the recovery of the patient that the medical experts feel that a new force has been isolated which will revolutionize the life of the human race.

"For several decades the commonwealths of our country have been increasingly burdened with the care of the abnormal. The care of the insane, the mentally deficient, the epileptic, the criminal, the psychopathic personalities has become one of the main costs of our national life.

"In addition, there has been an increasing demand that the states or the nations care for the tuberculous, the cancer cases, and other forms of incurable disease. Add to all this the hospitalization of our ex-service men and the entire country is loaded to the saturation point, simply with discharging its responsibility to its sick and disabled citizens.

"Crime also adds to the cost of government. Remove crime and you lessen the work of our judiciary to a minus point and also empty our prisons.

The general use of the Biddle serum promises all this and more to our nation. Mr. Biddle has offered it as a gift to the country if we can assure him that it will be wisely and properly used. He feels that its use should be available to everyone in this country, irrespective of race, wealth or social position.

"I have, therefore, prepared a law to be known as the *Serum Bill.* I am asking you to pass this law with such amendments as you see fit. If you can assure Mr. Biddle that the main features of the law as we have framed them will be preserved, he has promised to address you at once and give to the representatives of the medical profession, who have met with us at my invitation the formula of his serum, full directions as to its use and his opinion as to just what benefits the country will derive from his gift."

His message delivered, the President turned and sat down. Instead of applause there was a buzz of conversation. The Vice President rapped for order, and said:

"I am going to call on Senator Goresome of Montana."

Down the crowded center aisle walked a little dog, leading a man. The sight was a familiar one. For years the blind Senator had been led by his faithful dog. Reaching the rostrum, the dog sat down and looked up at his master and friend. The man turned, bent over and patted the animal on the head. The dog wagged his tail.

"MY friends," began the Montana Senator. "We have all received printed copies of the legislation, called the *Serum Bill*, which the President asks us to consider and, if we see fit, to make it a law. We have read the bill and approve of it. I have been in conference with the leaders of both Republican and Democratic parties, and they assure me that action will be taken as rapidly as is consistent with the rules of our respective bodies. Mr. Biddle need have no doubt as to our intentions in this matter. Both the House and Senate pledge themselves to support this legislation.

"Now, I wish to say something that is purely personal. I was born blind. For the last twelve years my little dog has led me through the dangers of this world and has led me safely. We have become inseparable friends. I think that if he discovered that he was no longer a necessity in my life, he would die of grief. Some weeks ago I received an injection of the Biddle serum. I recovered my sight, and now have perfect vision. It may have been a coincidence, but I feel that the serum gave me something I was sure I could never have. But in gaining my sight I saw that I might cause my little friend much suffering. He is growing old and will soon die. For the little while he lives I am going to pretend I am still blind. Just to make a little dog happy.

"Mr. Biddle, a man who was once blind but who can now see wishes to thank you for his sight. The world he now sees appears to be a very beautiful one. When I realize that the same gift I received can become the heritage of every blind person in the United States I am filled with awe and wonder. Sir, you are but a human being, but in your invention of this serum, you have been inspired by a power that is Divine.

"In your future you will receive due praise for your work. Your name will go down in the history of the Nation as one of its greatest benefactors. But I cannot wait for the future. I wish to take this opportunity of voicing the thought of a Nation that has not yet awakened to the gift you have given them. In the name of every man, woman and child, every one who is sick or afflicted, I thank you. If, at any future time, a grateful Nation can do anything for you, Mr. Biddle, all you have to do is to come to this chamber and ask it for help. Again a blind man who can see thanks you for the blessing of that sight."

He turned to walk back to his seat, the little dog leading him. There may have been an uneasy murmur when the President finished his message, but now there was wild applause. The legislatures, the audience, the press rose and gave to an individual the greatest personal tribute that the Senate Chamber had ever seen. Goresome and his little dog and his simple speech had touched the human heart more than any flight of oratory could ever have done. The audience was cheering Biddle, the inventor of the serum, but they were also

adding their tribute to the great leader who could, in his moment of happiness, think of the happiness of his little dog.

Biddle stood up and bowed, in response to the insistent clamor of the cheering throng. He went over to Goresome and took his hand. Just that, and not a word from either of them. Just a handshake.

CHAPTER XIV

Biddle Explains

AN hour later the scientist met twelve physicians in the President's office at the White House. The President was there, a stenographer, and one representative of the press.

The physicians had been carefully selected by the American Medical Association. Each was a specialist, and one was, in addition to being a physician, a noted chemist. After introductions Biddle began his explanation of the serum. He talked at length concerning the one celled animal, showed how man was simply a collection of such cells. He called their attention to the fact that under favorable circumstances the isolated cell could live indefinitely, whereas, in large masses, as in the body of a man, they rapidly died, could not reproduce, starved from lack of proper nourishment and ultimately produced such a poisoning of the system that the entire mass died.

He explained that his thought, years ago, had been to improve the circulation in such a way that the individual cell would live longer. Later he found that within the cell was a mass of energy, capable of providing life indefinitely if it could be liberated. He was not sure what this energy was; it might be some form of radiant vibration, it might be energy obtained from the splitting of the hydrogen atom. He had worked for some years on the problem of the release of this energy, and had finally solved it. Even in the solution he was very much in the dark. He simply knew that the injection of a certain serum or solution of chemicals gave an extra function to the individual cell and enabled it to release this energy just as well when it was in combination with millions of cells of the human body, as it could when it was isolated and detached from all others

Even there he was in doubt as to whether he was simply restoring a lost power to the cell or giving it a new power.

He had experimented with this solution on many forms of multicellular life. In all instances the effect was the same. It made a sick plant or animal well. Five years ago he had started to experiment with sick mammals and had cured various diseases. His work with the higher apes had been most interesting. At last he had felt justified in beginning his work with the human animal. The results had been identical with those he had seen in the lower types of animal life.

It was more and more clear to him, he explained, that all conduct that was selfish and anti-social was simply the result of sickness. He hoped that future work with the serum would make this thought a definite scientific fact. If it were true, then all sin and evil in the world could be wiped out, and man, following the Golden Rule, would leap upward toward the stars.

In his work with animals he felt that he had been able to prolong life. That would have to be considered. At present all that could be said was that the expectancy of life would be increased. How much would be added to the span of human existence would have to be determined by years of observation. The question of a second dose would also have to be experimented with. Person-

ally, he felt that the maximum result would be obtained from one dose of ten cubic centimeters.

He hoped that there would be an improvement in the intelligence of the nation. He was sure there would be some advance. Certain of the convicts had shown a remarkable increase in their intellectual quotient. That result also would have to be studied.

But, even if nothing more resulted than the improvement of the physical health of the nation, it would be worth while. He advised that the serum be made in at least a dozen laboratories and distributed free to every reputable physician. He understood that the Serum Bill would provide for pensioning the medical profession in return for their services. They would need some pension as, when the entire population was treated, there would be little or no work for either physician or surgeon, except in accident cases. Even in severe accidents a dose of the serum would perhaps cure without an operation.

He ended by giving the compostion of the serum and the manner of its preparation. It was not a true serum, but, rather, a watery compond of certain well known chemicals. He had called it a serum because that name was best appreciated by the laity. When he finished he asked the chemist if he understood and would be able to make it.

"Understand? Make it?" asked the chemist. "Why, it is so simple that anyone could follow the directions and make it. It is too simple. I wonder why no one thought of it before?"

"COLUMBUS and the egg," remarked the President. "And now, gentlemen, have any of you any questions to ask Mr. Biddle? He is very anxious to leave the city."

"How about the diet?" asked one of the doctors.

"Anything at all, but the person will eat less and less food and drink more and more water. He may use the hydrogen atom in the water. I am not sure."

"I think," said the President of the A. M. A., "that I have never met a man who knew more about a thing and was less sure of that knowledge. At the same time, it is not necessary to know how the drug works so long as we are sure of the fact that it does. I feel that Mr. Biddle has done his share. It is now our duty, as members of the greatest, most self-sacrificing profession in the world, to begin the work that will ultimately make us all hunt another job. You are not sure, Mr. Biddle, how much life will be prolonged?"

"I cannot answer that. Certainly some years."

"Do you think there is a chance that after a person lives a long time, he may gain the impression that he cannot die?"

"I do not know."

"Have any of the animals you have experimented with died?"

"None of them have died a natural death. Of course, I killed a number of them for microscopic study."

"Have you considered the great increase in population if the span of life is greatly prolonged?"

"Yes, but I do not think we need worry about it. Wealth will greatly increase. Life will be easier, happier. The healthy man will find new methods of socialization. In addition to all this there will be a decrease in the birth rate."

"What makes you think so?"

"I do not know. I just feel so. Perhaps man will be wiser."

"You, evidently, do not want to discuss this point. Why not?"

"Because I know so little about it."

"Have you anything to tell us? To advise us?"

"YES. I would first concentrate on the abnormals, those who are definite charges on the State. Emptying the hospitals and then see to it that every citizen of the United States receives his dose. You will have to be careful of the criminal class. They will probably try to escape. There is one thing in which I think, the medical profession should go on record. In regard to the prisoners, we should feel that every so-called bad man and bad woman was a sick man and sick woman. Once they have recovered from that sickness, they should be given liberty. You know my argument. The legal profession, the penologists must accept it. In fact, I had it written into the Serum law, but you must educate the public to the point where they will be willing to follow out that provision."

And, with that, he prepared to leave the room. He went into the President's private office for a last word.

"I forgot to ask you, but perhaps it was not necessary. How is your throat?" The cancer?"

"Cured! At least, that is what my specialists tell me."

"Good! That is fine."

Just then one of the private secretaries came into the office.

"The English Ambassador is here. He is demanding an interview with the President and Mr. Biddle."

"You know what he wants, Biddle?" asked the President.

"Certainly. He wants the formula so he can send it over to his country. He is just the first to ask for it. In the next twenty-four hours the world will be knocking at your door."

"I have been afraid of that. How would it be to effect a compromise? Tell them they can have the secret, if they promise to disarm and sign a treaty of everlasting peace?"

Biddle smiled; it was a rather timid, frightened smile.

"I do not think that will be necessary. I think we should tell them how to make it and advise them to give it to their entire population. If the serum works the way I think it will work, there will never be any more wars, treaties or no treaties. After all war is simply national insanity and a form of sickness. The serum ought to help. I believe it will. Of course, it is a big idea, Mr. President, and it is so big I am afraid of it, but I would advise you to talk frankly with the various ambassadors and give them the formula without restrictions. And, now, I must be going."

"Won't you stay for supper? I should like to give some of my friends a chance to meet you."

"No. My work here is over. I have a son. I want to go and see him."

CHAPTER XV

The School for Unusual Children

THE Mary Gregory School for Unusual Children was one of the first of its kind in America. The superrich in the past had built libraries, endowed museums, financed foundations for the eradication of disease, and had even built monuments to their family fame in the form of wide roads across an entire state.

But Mary Gregory, left more millions by her family than she or any other woman would know what to do with, built a school to care for fifteen hundred unusual children, and after it was built and completely furnished she employed the best personnel in the country to go there and work, and set aside an endowment sufficient to provide a thousand dollars income for each child per year. Then, and only then, she gave the entire school to the State of Maine. When she was criticized for giving it to

Maine rather than to New York, she simply smiled and said she felt that the children of Maine needed it.

At the head of the school she placed a man who for years had worked with the abnormal child. For twenty years he had studied them, cared for them, laughed and cried with them, and had tried to make them happy. He was a great man, who, in his simplicity, believed that after another twenty years of study he would begin to understand how to care for the unusual child.

Dr. Bonchield's motto for the entire school was, "HAPPINESS FIRST." He believed that, if the children were happy, the other essentials of life would be supplied them easily, provided, of course, there was money and intelligence.

Slowly fifteen hundred children were admitted to this school. They were all mentally deficient, of all grades, from the lowest idiot to the highest moron. But each child, irrespective of his intellectual quotient, was to be given an opportunity to advance to the limit of his ability. They were to be given academic education, occupational therapy, moral instruction, athletic diversion and emotional outlet.

When Biddle left Washington he went directly to this school. There he met, by appointment, Mary Gregory and Dr. Bonchield. Both of them knew him, as he made occasional visits to the school. Mary Gregory was growing old, but was still alert mentally.

"It appears," she said as she greeted Biddle, "that you have become a personage of international renown."

The scientist smiled.

"It seems that way; and that was the last thing I wanted; but certain things had to be done and in my doing them people had to find out who I was. Now that it is all over, I want nothing more than to sink back into obscurity. I have a little work to do here and then I intend to go to Canada. I have a little country place up there that I believe is safe from reporters."

"Up here in Maine," interrupted Dr. Bonchield," we are very much in the backwaters of life. Of course, we read the newspapers; Miss Gregory and I have been talking about it, trying to decide what it all means. Is it your thought that the serum will actually change our civilization? Or is that just the dream of the newspapers?"

"I do not believe that anyone knows just what it will do," was the scientist's serious reply. "We are too close to it. I feel that it will take twenty-five years at least before the final results can be analyzed. But there is no doubt that it will improve the health of the nation, lower the tax rate, and, I hope, increase the happiness of the individual."

Mary Gregory sighed,

"We received your letter and we have given it serious thought. Of course, we are going to help you to give our children the serum. It is impossible for us to refuse; but we feel that we know more about these children than you do, and we feel that we should warn you not to be overconfident of the results. You explain how we look at it, Doctor Bonchield."

"IT seems to us," said the Doctor, taking up the thread of the conversation, "that you should realize that mental deficiency is not a disease, but a condition; not a unity, but a scrap-basket. It arises from many causes. Some cases are hereditary, but feeble-mindedness can occur as a symptom of a number of other diseases and surgical conditions. In many instances the brain is so damaged that the intelligence is completely destroyed. We feel that there may be an improvement in the general health of the children, follow-

ing the injection of your serum, but there will not be any noticeable change in their deficiency. They will remain feeble minded."

"You may be right," admitted the scientist. "You certainly know a great deal more about it than I do. Mental defect was something I could not experiment with in the lower forms of life. Some of the convicts were rather low, but there were not enough of them to make any definite conclusion possible. All we can do is to give the serum and wait thirty days. I know that the maximum results will be reached in that time. I feel sure your own physicians will be able to do the work. There has been so much notoriety that I hesitated asking you to secure additional help. Of course, there was another reason."

"You mean the boy?" asked Mary Gregory.

"Yes. You see, I have been considerably worried about him. The entire work was done with him in mind. I have tried to keep him in the background as much as possible. Now, that I can be a little selfish and devote some time to my personal problems, I do not want the matter a subject of world gossip. How is the boy?"

"As well as can be expected. You know how those Mongolian cases are? low vitality, poor resistance to infection, always getting scratches and colds."

"You have no idea of the cause of Mongolianism?"

"No. Nothing new. It just happens."

Biddle stood up, placed a suitcase on the desk and opened it.

"I brought the serum along with me. Some of my own make; I wanted to be sure of it. If you are ready, suppose you call in the staff, explain matters to them and start with the injections."

"May I watch?" asked Mary Gregory.

"Certainly! You should be very much interested."

"I am. Fifteen million dollars worth. You realize what this will do to the School if it is successful? I shall have to find some other use for it. Of course, some of the children will have to be cared for anyway; they have no families. But if these children are given normal minds by your serum, the Mary Gregory School for Unusual Children will be simply a historical memory."

"And I," added Dr. Bonchield, "will be a man without a job."

"I will take care of you," said Mary Gregory, "if you will let me do it. Are you going to give us the serum, Mr. Biddle?"

"If you want me to. I thought we might as well give it to you and the staff, so they can observe my exact technique."

"Do you want to take care of your little boy yourself?"

"No. I have rather definite plans for him. I want you to give all of your patients the serum. Then wait thirty days. If, at the end of that time, you feel that it is curative, if you are pleased with the results, then give the regular dose to my boy. I am going up to Canada to rest and think. In sixty days I will be back for the boy. I am thinking of a trip to Europe with him. If he is well, he will enjoy that. How old is he now, Doctor?"

"Nearly twelve."

"Just right to be a dandy companion on a walking trip through the Black Forest. Let's get started. You know my plan. Just wait thirty days and then, if the other little boys and girls are helped as much as I hope they will be, give him his serum."

"Why not give it now, Mr. Biddle?" asked the Doctor.

"Because he is my son. I have to be sure. All this work was done to restore

him to normal mental health. If I give it to him and there are no results, life will not mean very much to me. I promised his Mother before she died that I would try to help him. There must be no failure. I must be sure. I shall be able to pass the sixty days very nicely. I have a lot to work over in my mind. I know you people and I trust you to make a correct decision."

"Will you give us your address?" asked the Doctor.

"No. I am giving that to no one. But I will be back in exactly thirty days after you give the boy his injection, sixty days from to-day, and, now, Miss Gregory will you let me give you the medicine?"

SIXTY days later the scientist walked, unannounced, into Dr. Bonchield's office.

"Well, Doctor, how are the children?" he, asked.

The specialist looked up.

"Oh! It is you, Mr. Biddle. The The children? Why, they are all well. In fact, the children are very well."

"Did the serum work?"

"Something did. Our boys and girls are normal, physically and mentally. The lame are walking, the blind seeing, the dumb talking. The idiots are learning to read and write. You never saw a healthier, happier, more intelligent lot of young people."

"That's fine. Hurry and get the boy ready. I want to go right back to Quebec and take the next boat for France."

"Your boy? Oh! I forgot. You see, we did not know where you were; so, there was nothing to do; no way to let you know."

"Didn't the serum help him?"

"He never received it. We had arranged to give it on the thirtieth day, according to your orders. The night before he went into coma, and in a few minutes he was gone. I saw him as soon as I could, but it was too late."

"Do you mean he is dead?" asked the puzzled scientist.

"Yes. I am terribly sorry."

"And you did not give him the serum?"

"No. You see he was dead before I could get to him."

"I wish you had given it to him anyway."

"But I didn't know— You surely do not mean that the drug brings the dead back to life?— Not that, Mr. Biddle? Surely not that?"

"I don't know. Perhaps it would have done no good."

"I am sorry."

"That is all right. But I wish you had given it to him anyway, even if he was dead, even though it would not have helped him. Perhaps in some way he would have known about it; known that I had not forgotten him; known that I wanted him to have his chance, like the rest of the children. Perhaps his Mother can explain it to him."

"Will you stay awhile with us? See the children?"

"No." replied Mr. Biddle. "I'll be going, back to my place in Canada. You see, I have a lot of things to think about now."

CHAPTER XVI

Life Is Different

THE Biddle Serum Bill, passed by Congress in record time, provided that every man, woman and child in the United States should receive, free of charge, one dose of the serum. Where possible to do so, preference should be given to the sick and aged and the little children. After that everyone should be cared for.

It was anticipated that there would be resistance from the antivivisectionists

and certain religious organizations. This opposition was provided for in the bill. No one had to take the serum but no one could refuse and continue residence in the United States. It was believed that the greatest benefit could not be derived from the drug if a residue of the population remained capable of contracting disease, becoming insane, or remaining social menaces.

There was, therefore, an exodus of conscientious objectors from the States. Most of these were good citizens but poor logicians. In addition, a large number of the underworld made every effort to escape the effect of the purifying drug. They fared rather well, once across the Mexican Border, but those who tried the Canadian route fared badly. Once caught and identified they were injected with the Biddle Serum and sent back to the States, better men, in spite of themselves. For Canada, in close spiritual sympathy with the United States, had not neglected to avail herself of this new medical gift.

THE actual giving of the serum was done by the members of the medical profession. As rapidly as they were supplied with the serum the one hundred and eighty thousand physicians and surgeons in the country started their campaign. Once it was made universally available, the demand for the drug increased daily. Long lines of rich and poor stood in front of the office of every physician. Not only the sick, but also the well, not only the miserable, but those fairly happy, who wished to stay happy. Children brought their aged parents, parents brought their little children. No longer the question, *WOULD IT WORK?* was asked, but the questions, *HOW SOON?* and *FOR HOW LONG?*

To the tens and hundreds of thousands of hopeless cases in hospitals, asylums and prisons the future that opened was such a startling change that there was, of necessity, a rather difficult period of readjustment. Those who had been insane for years recovered perfect health and sanity only to find their families dead, scattered or lost. Men discharged from prison after years of servitude found their wives remarried and their children almost strangers to them. But these were minor incidents; fortunately, the rejuvenates reentered a friendly, kindly world, where the question was, *HOW CAN I HELP YOU?* rather than, *HOW MUCH CAN YOU PAY FOR MY SERVICES?*

For the people of the United States were growing richer and happier every day. They were free from the need of supporting the sick, the indigent, the crippled, the abnormal, the epileptic, the insane, the criminal and the psychopath. There was neither drunkenness nor drug addiction. The Courts closed for lack of work, the police force of every city was decimated. Clear-eyed, steady-handed, free from sickness, the laborer was able to perform more work and was willing to.

There had always been enough wealth in the United States. Now, with the political leaders taking every opportunity to secure an equal distribution of the necessities of life to every one, poverty ceased to exist. It cost less to live. There was a gradual decrease in food consumption. Hunger became unknown. Work became joyous, amusements pleasurable and sleep a pleasant pastime.

While large masses of industries ceased to exist, those who were thrown out of work had no difficulty in finding other fields of activity.

The working day shortened. The dollar was more easily earned and was constantly increased in buying value. Everyone had something to do, every-

one received a living wage for doing it and all had lots of time for recreation.

Before the end of eighteen months the President was able to announce that over ninety-nine percent of the populace had been injected. Then began a concerted drive to force the remaining one percent to fall into line and to receive their serum. The work now was considerably slower, but, at the end of the second year, it was thought that everyone in the United States had been protected against disease.

THE Biddle Serum Bill provided for a Committee of Scientists who were to make constant observations on the efficacy of the new drug and from time to time were to report to the President of the United States and his Cabinet concerning the changes resulting in the social, economic, and hygienic life of the people. It was provided in the bill that the first report be made one year after the serum had been given to everyone. Thus, the first report was made three years following the giving of the first serum after the passage of the bill.

Biddle was supposed to be a member of that committee, but Biddle had disappeared. No one had the remotest idea of where he was. Certain questions would have been asked him had it been possible to do so. The thinkers of the nation were beginning to wonder. Other factors were forcing their way into the mental life of the nation, results of the serum, that no one had foreseen clearly during the months when the nation had become free from disease. These problems had to be faced.

In the first place, the death rate had dropped to a vanishing point. Except in cases of destructive accident people had ceased to die. The senile had rejuvenated to a healthy middle age, the young appeared to grow no older and the infants and adolescents simply continued to make the normal growth for their age. But no one died.

That fact, in itself, was not a cause for instant alarm. It was considered that finally the effect of the serum would wear out and that death again would appear as a friendly enemy of the human race. Perhaps old age could be deferred by repeated doses of the serum, but eventually the human organism would wear out and man would die, maybe of no special disease, but simply from a weariness of life.

But the thing that was startling and a little difficult to explain was the fact that the birth rate was as rapidly diminishing as was the death rate. For a while after the giving of the serum babies had been born, but as the months passed there were fewer of them and from the thirty-third to the thirty-sixth month of the experiment there was not a single birth reported in the entire United States. There were still lots of little children, growing up, beautiful little bronzed darlings, learning to walk and talk and do things, but there were no additional babies.

What did it mean? Was the cessation of death to be compensated for by the cessation of new life? Had Biddle known this?

The third factor that was causing interest was the increasing efforts of the human race to entertain itself. The long hours of leisure had to be filled in some way. Healthy, vigorous, active men refused to become idlers simply because they were not driven to effort by the spur of necessity. The dominance of production by machine power was beginning to pall. Mankind began to use their hands.

SOCIAL life became fuller and physically richer. With the increase of health and wealth and leisure there came

greater opportunities for marriage. It was no longer necessary to wait till a man was thirty or more for him to marry. Fewer women worked and more devoted themselves to the cultivation of happiness. A life free of illness and child-care made marriage an entirely different factor in the life of the human race than it had been in the pre-serum years. One philosopher said that all of its jobs had been amplified and elaborated and all of its sorrows and burdens minimized to the point of disappearance. It seemed that the human race was experiencing the co-relation and contacts of angels rather than the mere union of animals.

All these facts should have gone far to prolong the individual marriage and cause divorce to disappear as a social process. To the astonishment of the students of human behavior, this result did not follow. The percentage of divorce increased in direct proportion to the decrease in the death rate and the cessation of childbirth. Everybody was burden-free, everybody was married, but nearly everyone divorced his or her mate and tried again to make a more favorable and happier union. It really did not make much difference to a woman who her husband was, so long as she had one. All men were much alike, all healthy, industrious, vigorous and happily kind. All women were beautiful, intelligent and true to their husbands of the month. Everybody acted in a gentlemanly and ladylike manner, but the opposite sexes just did not seem to be able to live together for any length of time.

And the reason was not hard to find. The family had disappeared.

Husband and wife remained as ever, but children had disappeared from the picture.

In married life there was no cementing force.

CHAPTER XVII

Hiram Smith Takes a Trip

THE Purple Flash, more than any other newspaper, had profited by the changing social conditions. From the first, under the insistent urging of its secret owner, Hiram Smith, the one time Wolf of Wall Street, it had been the leading proponent of the necessity of the world's rapidly adjusting itself to the new order of life.

As a tabloid, it had ceased to exist. The pabulum on which the tabloid publications fed, which made possible the interest, fleeting and infantile, of the adenoid moron, was now a thing of the past. Gone were the days of murder, scandal and disclosures of gross immorality. These conditions ceased to exist with all other diseases. Of all publishers Smith was the first to see the handwriting on the wall and the need for a radical change. His daily was now called *The Rosey Dawn*, a name strikingly symbolic and suggestive of the new era. It had become a paper for the *intelligentsia*, the editorials of which appealed only to the best interests of the race.

Smith saw, with ever increasing interest and a growing concern, the changes in the emotional life of the country. Most people simply felt the increasing comfort and happiness and cared little for the profound biological chances back of those changes. Smith was interested. He was not sure that all was well with the new cultural pattern of life.

He wanted to talk things over with Biddle. But Biddle was gone. Smith thought about it for one day, talked it over with his wife for another day, and then issued his order. It was a short command of three syllables,

FIND BIDDLE!!

As that order had back of it over a

hundred million dollars there could be no doubt that Hiram Smith was in earnest.

Six months and five million were spent in the search and there was nothing to show for it except failure. It was Sally Fanning, who, with her womanly intuition, supplied the necessary clue. She reminded Smith that at one time Biddle had used the name of Harry Ackerman. Was it possible that he had reverted to the use of that name? So, Smith issued another order,

FIND HARRY ACKERMAN!!

And that order brought results.

Hiram took the night plane to Quebec, and the first boat out of there for Chicoutimi. He had to go down the St. Lawrence River and up the Saguenay River. On the little steamer chugged between high, precipitous cliffs of Laurentian granite, till at last, a thousand feet above them, to the left, they saw a Madonna, holding in her arms the Christ Child. Made out of wood, painted white and eighty feet high, it seemed little larger than a child from the river below.

"Go on to the next landing on the left," Smith told the Captain, "and let me off there."

"I do not think there is anyone living there now," protested the Captain. "Better go on to Chicoutimi."

"No. I know what I am doing."

So, he got off at the next landing. For the next hour the rich man toiled up the mountain path, arriving finally at the top. There he found a little stone house, with a little stone fence around it, and smoke pouring out of the chimney.

Smith knew that he had come to the end of the trail.

He knocked at the door, and, hearing no reply, opened it.

At a table, looking through a microscope, was Biddle.

"HELLO, Biddle!" called Smith.

"Well! Well!!" replied the astonished scientist. "How did you find me?"

"Cost me a lot of time and a lot of money, but it was time and money well spent. What are you doing here? Your place is back in the world, receiving the well-earned applause of the nation."

"I am not so sure about that. But won't you stay? Have you your baggage? I have not heard from the world for so long that I am interested, and then, besides that, I want the news from my friends. How are they? Mrs. Smith and the boy? and Harry Wild and Sally, and everybody?"

"You would be surprised. And you would not be asking that question if you were back in the world. No one ever says, 'How Are You Feeling?' because the answer is too obvious. The nation is gloriously healthy, and wealthy and perhaps, wise, though I am not so sure about that. The Missus is fine; we are still living together, and the boy is almost a man, the finest lad you ever saw. Harry Wild and Sally are married, and they are still living together. I guess we hold the record for lengthy marriages. But I wanted to see you. I just had to see you."

"I am glad you are here. How is *The Purple Flash?*"

"Has the largest circulation of any paper in the world, a real money maker. I changed the name to *The Rosey Dawn* and, believe me, it is a real mental hygiene, cultural sheet. You would not know it if you saw it."

"And you are still the Wolf of Wall Street?"

"In memory only. Wall Street has disappeared. When Congress passed the Stabilization bill, trading in stocks and bonds became a thing of the past. It

was just like trading pennies, nothing to it; it was not even good sport."

"So the financial world has changed?"

"Everything has changed. You would not know it for the same place. Come on back with me on the next steamer. You surely must be interested?"

"Yes, and, No. I realize that I should be, but I am working on a new problem. You see, I have a lot of little animal friends in the next room. I guess I was always happier with unsolved problems than with solved ones. If the world is purged from disease, I feel that I should be satisfied to leave it be that way. So, I just came away and left it. I would have had too many interruptions if I had remained."

"Of course you had your own reasons for isolating yourself?"

"Certainly! Most hermits do. But tell me about things. What are they doing in little old New York?"

"You mean the men or the women?"

"Everybody."

"WELL, they are all healthy and happy. Work about three hours a day, four days a week and the rest of the time amuse themselves in all kinds of new ways. That question of amusement would interest you. All the old-fashioned cottage industries are being revived, like weaving and metal-working. Most women are doing their own sewing and housekeeping. Not much cooking; you see, people do not eat the way they did, just drink lots of water.

"Everybody is married. All are just as happy as they can be till they decide to get a divorce and try somebody else. It is all a perfectly lovely arrangement, and, so far, there seems to be no jealousy. I have talked to lots of the divorcées and they simply say they just want to live with somebody else; so, they do it for two or three months and then try it all over again."

"Seeking happiness?"

"No. Everybody is happy all the time. Just want a change."

"How is the death rate?"

"There isn't any. Nobody dies unless there is some kind of a terrible accident. You see, there is no disease. Tell me one thing, Biddle. How long are we going to live?"

"I do not know."

"Do you think it is going to be *Life Everlasting?*"

"I really do not know."

"I hope not. You see, there is not much excitement in life nowadays. For some reason, the thrill has gone out of it. It has too much precision and not enough poker. Everybody has enough to eat, enough to wear, enough to amuse himself with, enough money to pay his simple expenses. There is nothing to worry about. In fact, some of my friends say that the young people who were just growing up when they received the serum cannot understand what we older ones mean when we say that we used to worry over the problems of life. They cannot understand what a life filled with sickness and debt and struggle, birth and death means. Even with the adults the memory is fast fading."

"I guess that is natural," said the inventor.

"Perhaps."

"What are the men doing with their spare time?"

"Oh! Various fads had their day. Jigsaw puzzles, crossword puzzles, cross-country walking, and all that sort of thing. Lately a good many of the men are whittling?"

"What?"

"Just making things out of a piece of wood with a penknife. Did you ever

see a man do that? Take a nice soft piece of white pine without any knots in it and just make a lot of nice long shavings? If you want to, you can do it mechanically, without thinking. The men were making all kinds of little things, model rowboats, and napkin rings, and little wooden birds and that sort of thing. Keeps the women busy at that."

"In what way?"

"YOU see, women always have been sort of clean creatures, but since they are free from disease and family duties and various cares, they have a lot of time on their hands. It seems that the healthier they become the cleaner they want their homes and surroundings to be. So, every woman spends a few hours a day out on the streets of New York, making the town tidy. It would be really comical if it were not so serious. I bet that for every whittler on the sidewalks of New York there is a woman, and sometimes two, waiting with a dust-pan and brush, to sweep up the shavings when the man gets through. Often they even hold a little bag so the shavings can drop right into the bag instead of on the street. Makes the man nervous and he goes somewhere else, but, wherever he goes, a woman is after him, tidying up. I hear there is an exclusive club in the Nineties just for whittlers, and they brag that never a woman will enter to disturb them or their shavings."

"Well, so long as everybody is happy!"

"Sure! What difference does it make! 'Let the chips fall where they may,' I said in an editorial. What difference does it make, so long as they are clean chips! But the women are certainly keeping after us men. I don't recall when they have ever kept us cleaner."

"How do the men feel about it?"

"Oh! Just about the way they always have. You see, the sexes are rather nice to each other; not like the old days when there was so much bickering. I suppose there is really very little to quarrel about, the way things are."

"Unpack your things," suggested Biddle, "and then we will take a walk. We will go down as far as the Madonna. You will be interested in that as a work of art."

Two hours later they stood in the cold chill of the afternoon in the shadow of the giant Mother. Smith looked at the scientist.

"By the way," he suddenly asked: "How is your boy?"

"I think that he is fine."

"Did he get better? You know what I mean? You said you were working on the serum for his sake."

"Yes. I remember I said that."

"And he is well and happy?"

"Yes. I think so. I haven't seen him for some time. You see, he is with his Mother."

Smith bent over, picked up a rock and threw it over the cliff into the river, a thousand feet below. He looked at the inventor.

"You are white, man!" he exclaimed. "That's odd! You must have been staying in the house too much. But all the rest of us are brown, a golden brown, a healthy beautiful hazel brown. The Doctors said it was the effect of the serum. You are not that way; you are white."

Biddle smiled, as he replied,

"You see, I never took the serum myself. With the wife and the boy away from me, somehow, I thought I would be happier if I went without it."

"But someday you will get sick, as we used to; and die!"

"That is why I never took it. It is cold. We should go back."

CHAPTER XVIII

The Robot Babies

MARY GREGORY had nothing to do.

Her School for Unusual Children was closed. There were no more unusual children.

In fact, there were few children of any kind and no babies.

Her restless mind, her ability as a philanthropist and her millions were all idle for lack of opportunity. She felt there should be something for her to do, someway in which she could benefit her nation. Deliberately seeking an opportunity for welfare, she went to New York City. There she called on Hiram Smith. Since her Father's death he had cared for the Gregory estate, and had made a good job of it. He had just come back from his trip to Canada, and had come back doing a lot of hard and difficult thinking.

"I am glad to see you, Mary," he said. "I have a lot to do with the investing of your money, but it is not often you spend the time to come and see me. You look well!"

"I am well. I guess we are all well, since we took the serum. I came to New York a week ago to see you, found you were out of town and decided to visit some of my old friends till your return."

"How are they all? Happy, I suppose?"

"Certainly! Everybody is happy; but I will say this. So many of them have developed the most peculiar way of spending their time. Of course, that seems to be the hardest thing to do, nowadays, finding things to fill in the leisure."

"What are they doing, Mary?"

"Playing with toys, playhouses, little sets of china, and taking care of pets. I never saw so many different kinds of animals and birds in my life, outside of a zoo. One of the girls even had a denatured skunk.

"And dolls! China, and rag, and bisque, black, white and yellow, big and little, pretty and ugly, fat dolls, dolls with spider legs, dolls with hair and without hair. Every woman is collecting dolls.

"Spending her time making dollie clothes, and giving tea parties for them. And that is not all. Some of them pretend that they are just little girls instead of big women. Found one of my friends playing on a toy piano. Waits till her husband goes to work and then starts with one or two fingers playing,

'Pony! Pony! Stepping high,
I will ride you bye and bye.'

"And that woman can play by the hour from Mozart and Beethoven. It does not seem to affect the men the same way. One of my old college chums, however, took me down into the cellar of their home. They live in a house that actually has a cellar. She said that her husband developed the habit of spending a good deal of time down there, and at last she became so curious that she just had to go down and see what he was doing. The man had been whittling dolls, out of wood, he put black shoe buttons in for eyes, and made the mouth red with red ink, or it might have been his blood, she thought. He had bought pieces of silk downtown and had tried to make dresses for the dolls and had made little beds for them to sleep in. She said that in the old days she just knows she would have cried, but, of course, nobody cries now, because all are too happy. She never told him she knew what he was doing, only after that, when he went to work she went down in the cellar and played with his whittled dolls. She said that in some way it made her feel that she was closer to him. They were thinking of a divorce, but, now, though they do not

talk about the dolls in the cellar, they feel that they had better live on together for a few more months."

"SO, that is the way they are spending their time?"

"That is the way. I thought and thought about it and finally I decided what to do. All this fuss over dolls and pets and childish pleasures is just a substitution. They are not honest with themselves, for what they really want is something alive, real babies."

"It seems that they cannot have them," answered Smith.

"It seems that way, but, perhaps, they will have them some-time, and if they wait too long, they won't know how to care for them. If this condition of childless society keeps up, there will be millions of women who have never held a little baby in their arms and would not know what to do if they found one there. You see, a lot of the knowledge of infant care is transmitted by word of mouth and actual practice from the older generation of women to the younger. If we wait fifty years before a new lot of babies are born, they will suffer from lack of actual knowledge on the part of their mothers to care for them. Even the nurses won't know how. There won't be any nurses anyway and not many doctors.

"So, I have an idea. I want you to take some of my millions and start a school for Mothers. Get the best physicians and nurses you can hire to prepare lectures. Buy a broadcasting station that will reach every part of the country. Give regular lectures on the care of the child at different ages, from birth to the age of six. I am sure that every woman will be glad to listen to the broadcasting of these talks, and will practice the various lessons on her baby."

"But the woman will not have a baby, Mary Gregory! That is what the whole trouble is. There aren't any babies."

"I want you to have some made!"

Hiram Smith threw up his hands in despair.

"How? Where? When? What do you mean?"

"Silly! I mean robot babies. Start your inventors to work. Fabricate babies out of rubber. Put machinery inside of them so they will cry and move their arms and legs. I just have the general idea, but any clever inventor will supply the details. Make babies that can be washed and fed and dressed and put to sleep. Make different sized babies, so they can be exchanged when the time comes for them to grow older. Put tonsils in them to be taken out, and adenoids to make them snuffle and intestines to give them colic. Start in and make twenty million of them as fast as you can. Sell them to the women who can pay and give them away to the women who cannot pay and send the bill to my estate. Do you see my idea? Get the fathers interested in it. Have lectures for them. Have such talks as this, *'What to do when your wife is sick and the three-year-old daughter complains of the earache.'* I wish Biddle was available. There is a man who would understand what I mean."

"Biddle is up in Canada. I have just been visiting him."

"You have? Did you talk about the disappeared birth rate?"

"I did."

"What did he say?"

"Not much. Something about having to pay a price for everything in life. That nothing was ever given away. I suppose he thought that the absence of death was paid for by the absence of birth, or something like that. He did not want to talk about children. Do you know about his having a boy? Told me the boy was doing well and was with his Mother."

"He said that?"

"Something like that. Do you understand it?"

"I do. That was just his way of saying they were both dead."

HIRAM SMITH started the millions of Mary Gregory to work. He gave the new idea considerable space in *The Rosey Dawn*. The novelty spread like wildfire. Women discarded their pets and their fantastic dolls and put in their application for a robot baby. Factories were opened, thousands of men put to work. That was an odd thing. Every invention making the robot babies possible, every minute of work done on them in the factories was masculine. Men almost fought for the right to work in those factories. Women were turned away in disdain. This work, said the men of the nation, was a purely masculine one.

Meantime, the series of lectures was being prepared. Only the greatest experts were employed. Experiences were exchanged, old books were read, elderly women were consulted, and at last two hundred lectures were written, covering every possible situation up to the age of six years. Then men and women were carefully tested for their ability to broadcast those lectures. At the end of a year everything was ready for the start of a six hour daily programme. By that time six million women had infant robots and more were being fabricated at the rate of a hundred thousand a week.

And from the station the lectures went to the waiting women in America. The seven o'clock bedtime lecture was instantly popular.

Women once again learned how to care for babies. But, cleverly built as they were, they were, at their best, simply well designed machines. They could be cared for, but they could not respond to that care; they could be loved, but they could not love. More than ever the women of America realized that their lives were empty and would remain empty till once again they were able to hold little children, real little children, pitiful, lovable, needful, helpless babies, in their arms.

Mary Gregory, she who had never known what it was to be a mother, recognized the need more and more clearly. She told Smith so.

"You have to find out whether Biddle can and will do something to help us," she demanded. "He knows more about the serum than any other living man. He ought to know what it can do and what it cannot do. If he will only tell us that in twenty-five, fifty years from now the American women can have children, we will be satisfied. It seems that we are all going to live a long time and we can wait if there is hope during the waiting and babies at the other end of the long years. You have to see him and tell him how we feel. See if he cannot help us in some way. More women in America now know how to take intelligent care of babies than ever before in the history of the world. What good is that knowledge if there are no babies? What good is living without babies! See him. If you cannot convince him of the need let me take a number of representative women up to Canada and state our case to him."

"I'll go," agreed Smith. "But I am afraid that he will not see this the way you see it."

"He will have to see it our way," exclaimed Mary Gregory.

CHAPTER XIX

The Women Decide

MARY GREGORY led a company of women into Canada.

At the last moment Hiram Smith refused to undertake the negotiations with Biddle, the inventor. He felt, somehow, that it was none of his business. He was not sure that he wanted to tell where the scientist had his house

of refuge from the world. But, after talking it over with his wife, he determined that he would throw the dice and let Fate decide what was in store for the future of the human race. So, he told Mary Gregory where Biddle lived and how to get there.

Biddle was accustomed to have the unexpected happen in his life, but he was genuinely surprised when twenty-one women suddenly came up to his stone home and knocked at the door. He did his best to be polite and tried to find seats for all of his visitors. He made tea for them and served it with some little cakes, but they had to take turns drinking the tea, because no lonely hermit ever had twenty-one tea cups unless he had a mania for collecting them, and not many isolates even had twenty-one little cakes at one time.

But at last everyone had a little tea and then the women asked Biddle to sit down and listen to the reason for their visit. Mary Gregory acted as the spokesman for the delegation.

"We represent the Federated Women's Clubs of North America," the rich woman explained. "These women stand for the best of womanhood in every walk of life. We feel that we know what the American woman thinks, how she feels, what she wants. Our requests to you come from fifty million mature women; any action we take will be satisfactory to all of our sisterhood. Now, that you know who we are, may we ask you some questions?"

"You may ask them. I am not sure I can answer them."

"We understand that," said Miss Gregory. "We know that some questions may be hard, even impossible for you to answer, but, at least, we know that you will tell the truth. First. How long will the serum last? Will it have to be renewed? Will future doses be as powerful? Will the individual reach maturity and remain there indefinitely?"

"I am not sure. My opinion is that the first dose of serum will last a very long time. All that it did was to liberate power, which power is evidently capable of splitting the hydrogen atom to make more power. Consequently, it may act somewhat like perpetual motion.

"If it acts the way I think, no one will ever have to take the second dose. But if he should take a second dose, he probably will receive the same effect as from the first dose. Of course, I may be wrong. It seems that when a person once has the serum, he will live for a long time, a full grown, healthy vigorous adult. He would die by drowning, or by being cut in two by an accident, but, unless something terrible happened to him, he would live a very long time."

"Why have the women of America become childless?"

"I am not sure. All I know is that all the animals I experimented on became sterile. Perhaps it is a provision of nature to increase the power of the serum. Perhaps there is something in the serum that acts. But I knew it to be true in the animals I experimented with, like mice. I hoped that it would not be true in the human race; that was one of the things we had to gamble on."

"Do you believe that some time, twenty-five years from now, or fifty years, the conditions will change and children will once again be born into the world?"

"Probably not. I have twelve mice who have had the serum for nearly five years. That is a long time for a mouse to live. They have never had any little ones."

"What is your thought in regard to the problem?"

"IT looks as though it was a kind of arrangement, the only way things could happen. Suppose, with the help of the

serum, the average man and woman lives to be a thousand years old. Suppose that every three years each woman gave birth to a child. Gloriously healthy herself, fully realizing what the serum did for her, she would insist that her children receive the serum as soon after birth as possible. In no time at all the world, large as it is, would be overcrowded with humanity? Now we have a population that can be cared for. It will never grow any larger, and only very slowly will it grow smaller."

"Do you realize what it means to the women of America to face those childless years, those barren centuries of existence?"

"Perhaps. As much so as a lone man can realize a woman's feelings. But you women have everything else; health, happiness, ease, the love of your husbands, every possible comfort. You have a life that is incomparably easier than the old life ever could be. It looks as though you should be happy."

"Is there anything you can do for us that will enable us to have families?"

"Perhaps. There again I am not sure. But the principle of opposites is a very strong one in nature. We have light and darkness, strength and weakness, men and women, heat and cold. We used to have laughter and tears, happiness and sorrow, health and sickness, sweet and sour, pure living and sin. And we have serums and antiserums. After I discovered the Biddle Serum, I started to discover the antidote, or antiserum. I did not want to use it, but I wanted to see if there was such a thing."

"Did you find it?"

"I think so. At least, this is what I did. I found a mouse with cancer, and gave her the serum. The cancer disappeared and the mouse lived on, far past the usual length of life for a mouse. I became rather fond of her, and I guess she liked me a little. But she never had any babies. Two months ago I gave her an injection of the antiserum. She produced a little family, raised them to independence, started to grow the cancer and died. In that case the antiserum did all that could be expected of it."

"Could you give the antiserum to the nation, as you gave the serum?"

"Yes, if it became the right thing to do."

"And it is your opinion that if a woman received the antiserum, she would have children?"

"Yes. Of course, it would be necessary for her husband to have the antiserum also. Perhaps not. I am not sure, but I think so."

"Would you excuse us if we talked this thing over privately?"

"CERTAINLY. I will walk over to the Madonna. You can find me there. It is only a few city blocks from here."

One hour later the women walked over to where Biddle was standing in the shadow of the Madonna.

"We have decided," announced Mary Gregory. "The women of America ask you for the formula of the antiserum?"

"For general distribution?"

"No. But we feel that every man and wife who really want to have a family should be allowed to make the decision. Those who wish to remain childless can do so."

"Are you sure you know what you are asking for?"

"We are."

"It cannot be," declared Biddle. "Never, in the history of the human race, have women been as free as they are now. They can come and go, free from the chains of a home and family. Their love life is liberated from anxiety. There is no longer sickness to fear, the death of loved ones to dread. You are happy, healthy and able to compete in every way

on equal terms with the male. Everything woman has striven for in the past you now have. Do you mean to say that you are going to give it up? Deliberately sacrifice all you have gained?"

"We want our babies!" cried the women.

"But in having them you lose your immortality. Having them you no longer are eternal. You will become sick, diseased, crippled. Some of you will die in childbirth. Some of your children will die; others will live to become defectives, epileptics, cripples. Some of the ones who live to maturity will cause you shame; they will become insane, criminals. You will see children die in your arms. In years to come you will wish they had died while they were sweet babies. Sickness will come, suffering, sorrow. Your health will break, your husbands will leave you for fresher women. You will die with one hand on your breaking heart and the other on the broken cross. That is what you are asking for. Do you mean to tell me that you, knowing what the old biological urge for offspring meant to womankind, want to change your glorious existence of to-day for that?"

"We must have our babies!" cried the women.

"YOU must remember what life was. Sickness, invalidism, the breaking back that never lost its ache, etc., etc.

Mary Gregory stepped forward.

"Give us the formula, Sidney Biddle. We have decided. Nothing you can say will make us change our minds. You have not told us a thing we do not know. We know that we speak for our sisterhood. Give us the formula, Sidney Biddle. Give us back our babies."

Trembling, the scientist took out a notebook and wrote slowly on a blank page. At last he tore the page out and handed it to the rich woman.

"Here is what you are asking for. Any chemist can make it; any physician give it. Now, may I ask you to leave me here? I want to be alone once more."

They all left except Mary Gregory.

"Why do you stay here in the shadow?" she asked.

"Because that Woman knows how I feel. She knows what it means to have a son die and not be able to save him Like her Son died and mine."

"Why did you not take the serum Sidney Biddle?"

"Because I did not want to live forever," he replied.

CHAPTER XX

Old Lives for New

BIDDLE lived alone for two more years and then determined to go back to civilization. The first person he called on was Hiram Smith, the secret owner of *The Rosey Dawn*. The rich man was delighted to meet his friend again.

"You look a little older, a few more white hairs, but still very fit. I guess that arctic air agrees with you, Biddle."

"I guess so; clean living and hard work are fine medicines. How are you? Not quite as brown as when I saw you last. Anything happen?"

"Slightly. That boy of ours decided to fall in love. Mighty nice girl, and we were all in favor of their marriage. The first thing we knew, after the wedding, they went and took a dose of your antiserum, so they could have a child. That just spoiled it all for the wife and me. We had been making plans to live at least for a thousand years but that would mean that we would see our children and our grandchildren grow old and die while we were still in the vigorous golden maturity of the Biddle Serum. So, what did we do but go and get some of the antiserum ourselves! Now, when the grand-

children come to visit us, they will have the old fashioned kind of grandparents, just nice, old, white-haired people, who can try to live their youth again in their children's children."

"So, you sacrificed everything, not for the love of a child, but for the love of a grandchild?"

"That's it. You would think it was sacrifice if you had seen me with an attack of rheumatism this last week."

Biddle laughed, a friendly, sympathetic tearful laugh.

"Just an old fool, you were, Smith, just an old fool. By the way. Where are my old friends, Harry Wild and Sally Fanning?"

"They are married. He is back at the old news stand, and they have a little apartment close to where they both lived before you met them. Makes me worry about the boy, seeing Harry nowadays."

"Give me the address."

"Sure; but I do not think I would go and see them. You remember how they were the time you saw them on the lawn in front of my home? Well, when you remember them, just think of them the way they were then."

"I shall have to see them the way they are now," replied Biddle. "I have to find out something."

He called at the little apartment late that night. Harry Wild answered his knock on the door.

"It's Ackerman! Sally, it's Ackerman, our old friend, and more than welcome. Come right in, and sit down. Let me have your hat, Sir. This is an honor to have you come and see us."

"It is, indeed," echoed Sally.

"And how are all the mice?" asked Biddle.

"You should see them," replied Sally. Dozens of them, into everything, but I will say this, that the Baby is fond of them. Keeps quiet for an hour at a time when I am too busy to amuse her, just watching them play around the floor."

"So, there is a baby?"

"Finest girl you ever saw," said the newsboy. "Looks just like her Mother. Glad it was a girl, we should not have known what to do with a boy."

"We are telling her that, so she won't think we were disappointed," explained Sally. "We are saying it now, before she knows the meaning of words, so we shall be sure to say it when she learns to talk. We want her to be sure we loved her."

They insisted that he come and see the baby. They made him say that he had never seen a finer baby; and they fed him coffee and sandwiches, and made him promise he would come often to see them. When he left, Harry went down to the front door with him.

AS they stood in the doorway, Biddle looked at the little man curiously.

"You are lame, Harry," he said. "Have you hurt yourself?"

"No. But my old trouble came back, my bad leg is short again and my back is slowly growing crooked."

"Well, well! That is too bad. But you keep on smiling?"

"Sure. I have everything to live for now. Fine wife, sweet baby, good business. Why shouldn't I be happy."

"That is fine, Harry. Keep on smiling."

"I will, Mr. Biddle. Bye the way, do you know of a good remedy for asthma? Sally has had some real bad spells since the baby came and I do wish someone knew what to do for her."

"I am sorry. I'll send her some stramonium leaves. Burn them and inhale the smoke. That will help her. Asthma is a difficult thing to cure. Well, good night, Harry, my boy. I am glad about the baby."

"Good night, Mr. Biddle, and thanks for looking us up. Send me your address.

Next week the old *Purple Flash* is going to come back on the stands and I want to send you some of the first copies. I bet that the Wolf of Wall Street will make it a real tabloid. It ought to go big. The people are getting hungry for that kind of a paper."

It was all too much for Biddle.

He took the first train for Quebec and the first boat for his mountain home. He walked slowly up the mountain path. It was a hard climb. He was not as young as he had been. He found the house open and a fire burning in the fireplace. No one there.

He put down his bag and walked across the crest of the mountain to the Madonna. Under the shadow a woman sat. As he came near she walked over to meet him.

"Mary Gregory!" he sighed, "What are you doing here?"

"I wanted to come," she replied. "You need a woman. If you had a woman in the house with you, you might do something worth while, invent something that would be of real help to mankind."

"But I am an old man, Mary," he cried. "An old man, growing older.

"I have taken the antiserum," she said. "Now, I can grow old with you."

THE END.

IN THE SEPTEMBER ISSUE

Two new serials begin in this issue. The one is "Through the Andes," by A. Hyatt Verrill, the eminent archæologist, and the other is "The Moon Pirates," by Neil R. Jones, a favorite author with our readers for many years.

A complete story, "The Master Minds of Venus," by William K. Sonneman, will be found most interesting.

There will be a number of other good science fiction tales in this issue.

Measuring a Meridian

By JULES VERNE

Conclusion

The story of the measurement of a meridian of the earth is concluded in this issue. Less of the science of the story appears here, as the earlier portions have given a most interesting detail of the meaning of these measurements. So now we see more of the wild life in Africa and finally the party separates and breaks up.

Illustrated by MOREY

CHAPTER XXI

Let There Be Light

"WE are no worse off," remarked the Colonel in the course of the day to his assembled companions, "than Arago, Biot and Rodriguez were when they were measuring the arc from Dunkirk to Ivica; they were uniting the Spanish coast and the island by a triangle of which the sides were more than eighty miles long. Rodriguez was installed on an isloated peak, and kept up lighted lamps at night, while the French astronomers lived in tents a hundred miles away in the desert of Las Palmas. For sixty nights Arago and Biot watched for the signal, and, discouraged at last, were about to renounce their labor, when, on the sixty-first night, appeared a light, which it was impossible to confound with a star. Surely, gentlemen, if those French astronomers could watch for sixty-one nights in the interests of science, we English and Russians must not give up at the end of nine."

The Colonel's companions most heartily approved the sentiment; but they could have said that Arago and Biot did not endure the tortures of hunger during their long vigil of some two months.

In the course of the day Mokoum perceived an unusual agitation in the Makololo camp. He thought at first that they were about to raise the siege, but, after some contemplation, he discovered that their attentions were evidently hostile, and that they would probably assault the mountain in the course of the night.

Toward six o'clock, when the night was coming on with its tropical celerity, the engineer descended the mountian, and proceeded to light the boiler fire of the steamboat. It was still the Colonel's intention not to effect an escape until the last extremity; moreover, he was firm in his determination to abide until the night was advanced, that he might give himself the last chance of observing the signal from Mount Volquiria. The sailors were placed at the foot of the rampart, with orders to defend the breaches to the last. All arms were ready, and the mitrailleuse, armed with the ammunition that they had in store, spread its formidable mouth across the embrasure.

For several hours the Colonel and Strux, posted in the narrow donjon, kept a constant watch on the peak of Volquiria. The horizon was dark, while the finest of the southern constellations were resplendent in the zenith. There was no

It was probable that the natives were about to make a last attack on the fortress before retiring finally to Maketo.

wind, and not a sound broke the imposing stillness of nature. The bushman, however, posted on a projection of rock, heard sounds which gradually became more distinct. He was not mistaken; the Makololos were at length commencing their assault on the mountain.

Until ten o'clock the assailants did not move; their fires were extinguished, and camp and plain were alike wrapped in obscurity. Suddenly Mokoum saw shadows moving up the mountain, till the besiegers seemed but a few hundred feet from the plateau on which stood the fort.

"Now, then, quick and ready!" cried Mokoum.

The garrison immediately advanced to the south side of the fort, and opened a running fire on the assailants. The Makololos answered by a war cry, and, in spite of the firing, continued to advance. In the light caused by the flash of the guns, the Europeans perceived such swarms of natives that any resistance seemed impossible. But still they trusted that their well-directed balls were doing considerable execution, and they discerned that not a few of the natives were rolling down the sides of the mountain. Hitherto, however, nothing arrested them. With savage cries they continued to press on in compact order, without even waiting to hurl a single assegai. Colonel Everest put himself at the head of his little troop, who seconded him admirably, not excepting Palander, who probably was handling a gun for almost the first time. Sir John, now on one rock now on another, sometimes kneeling, sometimes lying, did wonders, and his gun, heated with the rapidity of the repeated loading, began to burn his hands. Mokoum, as ever, was patient, bold, undaunted in his confidence.

But the valor and precision of the besieged could avail nothing against the torrent of numbers. Where one native fell, he was replaced by twenty more, and, after a somewhat prolonged opposition, Colonel Everest felt that he must be overpowered. Not only did the natives swarm up the south slope of the mountain, but they made an ascent also by the side slopes. They did not hesitate to use the dead bodies of the fallen as stepping stones, and then even lifted them up, and sheltered themselves behind them, as they mounted. The scene revealed by the flash of the firearms was appalling, and the Europeans saw enough to make them fully aware that they could expect no quarter, and that they were being assaulted by barbarians as savage as tigers.

At half-past ten the foremost natives had reached the plateau. The besieged, who were still uninjured (the natives not yet having employed their bows and assegais), were thoroughly conscious they were impotent to carry on a combat hand to hand. The Colonel in a calm, clear voice that could be heard above the tumult, gave the order to retire. With a last discharge the little band withdrew behind the walls. Loud cries greeted their retreat, and the natives immediately made a nearer approach in their attempt to scale the central breach.

A strange and unlooked for reception awaited them. Suddenly at first, and subsequently repeated at intervals of but a few minutes, there was a growling reverberation as of rolling thunder. The sinister sound was the report of the exploding mitrailleuse, which Sir John had been prepared to employ, and now worked with all his energy. Its twenty-five muzzles spread over a wide range, and the balls, continually supplied by a self-feeding arrangement, fell like hail among the assailants. The natives, swept down at each discharge, responded at first with a howl and then with a harmless shower of arrows.

"She plays well," said the bushman,

approaching Sir John. "When you have played your tune, let me play mine."

But there was no need for Sir John to be relieved; the mitrailleuse was soon silent. The Makololos were struck with consternation, and had sought shelter from the torrent of bullets, having retired under the flanks of the fort, leaving the plateau strewn with numbers of their dead.

In this instant of respite the Colonel and Strux regained the donjon, and there, collecting themselves in composure as complete as if they were under the dome of an observatory, they kept a constant eye upon their telescope, and scanned the peak of Volquiria. When, after a short period of rest, the yells of the Makalolos made them aware that the combat was renewed, they only persevered in their determination, and resolved that they would alternately remain to guard their invaluable instrument.

The combat, in truth, had been renewed. The range of the mitrailleuse was inadequate to reach all the natives, who, uttering their cries of mortal vengeance, rallied again, and swarmed up every opening. The besieged, protected by their firearms, defended the breaches foot by foot; they had only received a few scratches from the points of the assegais, and were able to continue the fight for half an hour with unabated ardor.

Toward half-past eleven, while the Colonel was in the thick of the fray, in the middle of an angry fusillade, Matthew Strux appeared at his side. His eye was wild and radiant; an arrow had just pierced his hat and quivered above his head.

"The signal! the signal!" he cried.

The colonel was incredulous, but ascertaining the correctness of the welcome announcement, discharged his rifle for the last time, and with an exuberant shout of rejoicing, rushed toward the donjon, followed by the intrepid colleague. There, kneeling down, he put his eye to the telescope, and perceived with the utmost delight the signal, so long delayed and yet so patiently expected.

It was truly a marvelous sight to see these two astronomers work during the tumult of the conflict. The natives had by their numbers forced the enclosure, and Sir John and the bushman were contending for every step. The Europeans fought with their balls and hatchets, while the Makololos responded with their arrows and assegais.

Meanwhile the Colonel and Strux intently continued their observations, and Palander, equally composed, noted down their oft repeated readings. More than once an arrow grazed their head, and broke against the inner wall of the donjon. But their eye was ever fixed on the signal, and reading the indications of the vernier, they incessantly verified each other's calculations.

"Only once more," said Strux, sliding the telescope along the graduated scale. An instant later, and it would have been too late for any observations, but the direction of the light was calculated to the minutest fraction of a second; and at that very instant an enormous stone, hurled by a native, sent the register flying from Palander's hands, and smashed the repeating circle.

They must now fly in order to save the result which they obtained at the cost of such continuous labor. The natives had already penetrated the casemate, and might be at any moment appear in the donjon. The Colonel and his colleagues caught up their guns, and Palander his precious register, and all escaped through one of the breaches. Their several companions, some slightly wounded, were ready to cover their retreat, but just as they were about to de-

scend the north side of the mountain, Strux remembered that they had failed to kindle the signal. In fact, for the completion of the survey, it was necessary that the two astronomers on Mount Volquiria should in their turn observe the summit of Mount Scorzef, and were doubtless anxiously expecting the answering light.

The Colonel recognized the imperative necessity for yet one more effort, and whilst his companions, with almost superhuman energy, repulsed the natives, he re-entered the donjon. This donjon was formed of an intricate frame work of dry wood, which would readily ignite by the application of a flame. The Colonel set it alight with the discharge from the muzzle of his gun, and, rushing out, rejoined his companions. In a few moments, rolling their mitrailleuse before them, the Europeans under a shower of arrows and various missles, were descending the mountain, and, driving back the natives with a deadly fire, reached the steamboat. The engineer, according to orders, had kept up the steam.

The mooring was cast off, the screw set in motion, and the *Queen and Czar* advanced rapidly over the dark and quiet waters. They were shortly far enough out to see the summit of the mountain. The donjon was blazing like a beacon, and its light would be easily discerned from the peak of Volquiria. A resounding cheer of triumph from the English and Russians greeted the bonfire they had left behind.

Emery and Zorn would have no cause for complaint; they had exhibited the twinkling of a star, and had been answered by the glowing of a sun.

There was no question that the conflagration they had started had given the best possible indication of the position of Mount Scorzef. The triangle was closed. The work was completed at the last moment.

CHAPTER XXII

Palander's Last Escapade

WHEN daylight reappeared the vessel was nearing the northern shore of the lake. There was no trace of natives, consequently the Colonel and his companions, who had been ready armed, laid aside their guns as the *Queen and Czar* drew up in a little bay in the rocky shore. The bushman, Sir John and one of the sailors set out at once to reconnoiter the neighborhood. They could perceive no sign of Makololos, and fortunately they found game in abundance. Troops of antelopes grazed in the long grass and in the shelter of the thickets, and a number of aquatic birds frequented the shores of the lake. The hunters returned with ample provision, and the whole party could enjoy the savory antelope meat, a supply of which was now unlikely to fail them again.

The camp was arranged under the great willows near the lake, on the banks of a small river. The Colonel and Strux had arranged to meet on the north shore with the pioneer's little party, and the rest afforded by the few days of expectation was gratefully enjoyed by all. Palander employed himself in rectifying and adjusting the results of the latest observations, while Mokoum and Sir John hunted most vigorously over the fertile, well-watered country, abounding in game, with which the Englishman would have been delighted, had it been in his power, to complete a purchase, on behalf of the British government. Three days after, on the 8th of March, some gun-shots announced the arrival of the remainder of the party for whom they tarried. Emery, Zorn, the two sailors, and the pioneer, were all in perfect health. Their theodolite, the only instrument remaining

to the Commission, was safe. The young astronomers and their companions were received with joyous congratulations. In a few words they related that their journey had not been devoid of difficulty. For two days they had lost their way in the forests that skirted the mountainous district, and with only the vague indication of the compass they would never have reached Mount Volquiria, if it had not been for the shrewd intelligence of the pioneer. The ascent of the mountain was rough, and the delay had caused the young astronomers as much impatience as it had their colleagues on Mount Scorzef. They had carefully, by barometrical observations, calculated that the summit of Volquiria was 3,200 feet above the level of the sea. The light, increased by a strong reflector, was first lighted on the night of the 4th; thus the observers on Mount Scorzef had perceived it as soon as it appeared. Emery and Zorn had easily discerned the intense fire caused by the burning fortress, and with the theodolite had completed the measurement of the triangle.

"And did you determine the latitude of the peak?" said the Colonel to Emery.

"Yes, most accurately," replied Emery; "we found it to be 19° 37′ 35.337″."

"Well, gentlemen," said the Colonel, "we may say that our task is ended. We have measured, by means of sixty-three triangles, an arc of more than eight degrees in length; and when we have rigidly corrected our results, we shall know the exact value of the degree, and consequently of the mèter in this part of the globe."

A cheer of satisfaction could not be repressed amongst the others.

"And now," added the Colonel, "we have only to descend the Zambesi in order to reach the Indian Ocean; is it not so, Mr. Strux?"

"It is," answered Strux, "but I think we ought still to adopt some means of testing our previous operations. Let us continue our triangles until we find a place suitable for the direct measurement of a base. The agreement between the lengths of the base, obtainind by the calculations and by the direct measurement, will alone tell what degree of accuracy we ought to attribute to our observations."

Strux's proposition was unanimously adopted. It was agreed to construct a series of subsidiary triangles until a site could be measured with the measuring rods. The steamboat, descending the affluents of the Zambesi, was to await the travelers below the celebrated Victoria Falls. Everything being arranged the, little troop, with the exception of four sailors on board the *Queen and Czar*, started the next day at sunrise. Some stations had been chosen to the east and the angles measured, and, along this favorable country, they hoped easily to accomplish their auxiliary series. The bushman had adroitly caught a quagga, of which, willing or unwilling, he made a beast of burden to carry the theodolite, the measuring-rods, and some other luggage of the caravan.

The journey proceeded rapidly. The undulating country afforded many points of sight for the small accessory triangles. The weather was fine, and it was not needful to have recourse to nocturnal observations. The travelers could nearly always find shelter in the woods, and, besides, the heat was not insufferable, since some vapors arose from the pools and streams which tempered the sun's rays. Every want was supplied by the hunters, and there was no longer anything to be feared from the natives, who seemed to be more to the south of Lake Ngami.

Matthew Strux and the Colonel seemed to have forgotten all their personal rivalry, and although there was

no close intimacy between them, they were on the most perfect terms of courtesy.

Day after day, during a period of three weeks, the observations steadily proceeded. For the measurement of a base the astronomers required a tract of land that should be level for several miles, and the very undulations of the soil that were desirable for the establishment of points of sight were unfavorable for that observation. They proceeded to the northeast, sometimes following the right bank of Cnobi, one of the principal tributaries of the Upper Zambesi, in order to avoid Maketo, the chief settlement of the Makololos. They had now every reason to anticipate that their return would be happily accomplished, and that no further natural obstacles would occur, and they hoped that their difficulties were all at an end. The country which they were traversing was comparatively well known, and they could not be far from the villages of the Zambesi which Livingstone had lately visited. Thus they thought with reason that all the most arduous part of their task was over, when an incident, of which the consequences might have been serious, almost compromised the result of the whole expedition.

Nicholas Palander was the hero, or rather was near being the victim, of the adventure.

The intrepid but thoughtless calculator, unwarned by his escape from the crocodiles, had still the habit of withdrawing himself from his companions. In an open country there was no great danger in this, but in woods Palander's abstraction might lead to serious consequences. Strux and the bushman gave him many warnings, and Palander, though much astonished at what he considered an excess of prudence, promised to conform to their wishes.

On the 27th, some hours had passed since Strux and Mokoum had seen anything of Palander. The little troop were traveling through thickets of low trees and shrubs, extending as far as the horizon. It was important to keep together, as it would be difficult to discover the track of any one lost in the wood. But seeing and fearing nothing, Palander, who had been posted, pencil in one hand, the register in the other, on the left flank of the troop, was not long in disappearing.

When, toward four o'clock, Strux and his companions found that Palander was no longer with them, they became extremely anxious. His former aberrations were still fresh in their remembrance, and it was probably the abstracted calculator alone by whom they had been forgotten. The march was stopped, and they all shouted in vain. The bushman and the sailors dispersed for a quarter of a mile in each direction, beating the bushes, trampling through the woods and long grass, firing off their guns, but yet without success. They became still more uneasy, especially Matthew Strux, to whose anxiety was joined an extreme irritation against his unlucky colleague. This was not the first time that Palander had served them thus, and if the Colonel had laid any blame on him, Strux would not have known what to say. Under the circumstances, the only thing to be done was to encamp in the wood, and begin a more careful search.

The Colonel and his companions had just arranaged to place their camp near a glade of considerable extent, when a cry, unlike anything human, resounded at some distance to the left. Almost immediately, running at full speed, appeared Palander. His head was bare, his hair disheveled, and his clothes torn in some parts, almost to rags. His companions plied him with questions; but the unhappy man, with haggard and

distended eye, whose compressed nostrils still further hindered his short, jerking respiration, could not bring out a word.

What had happened? Why had he wandered away? And why did he appear so terrified? At last, to their repeated questions, he gasped out, in almost unintelligible accents, something about the registers.

The astronomers shuddered; the registers, on which was inscribed every result of their operations, and which the calculator had never allowed out of his possession, even when asleep, these registers were missing. No matter whether Palander had lost them, or whether they had been stolen from him; they were gone, and all their labor was in vain!

While his companions, mutely terrified, only looked at each other, Matthew Strux could no longer restrain his anger. He burst forth into all manner of invective against the miserable creature, threatening him with the displeasure of the Russian government, and adding, that if he did not suffer under the knout he should linger out his life in Siberia.

To all this Palander answered but by a movement of the head; he seemed to acquiesce in all these condemnations, and even thought the judgment would be too lenient.

"But perhaps he has been robbed," said the Colonel at last.

"What matters?" cried Strux, beside himself; "what business had he so far away from us, after our continual warning?"

"True," replied Sir John, "but we ought to know whether he has lost the registers or been robbed of them. Has anyone robbed you, Palander?" continued he, turning to the poor man, who had sunk down with fatigue.

Palander made a sign of affirmation.

"Who?" continued Sir John. "Natives? Makololos?"

Palander shook his head.

"Well, then, Europeans?" asked Sir John.

"No," answered Palander in a stifled voice.

"Who then?" shouted Strux, shaking his clenched fists in Palander's face.

"They were neither natives—nor white men—but monkeys," stammered out Palander at last.

It was a fact that the unhappy man had been robbed by a monkey, and if the consequences of the incident had been less serious, the whole party would have broken out into laughter. Mokoum explained that what had just happened was of frequent occurrence. Many times, to his knowledge, had travelers been rifled by these pig-headed chacmas, a species of baboon very common in South African forests. The calculator had been plundered by these animals, though not without a struggle, as his ragged garments testified. Still, in the judgment of his companions, there was no excuse to be made; if he had remained in his proper place this irreparable loss would not have occurred.

"We did not take the trouble," began Colonel Everest, "to measure an arc of meridian in South Africa for a blunderer like you——"

He did not finish his sentence, conscious that it was useless to continue to abuse the unhappy man, whom Strux had not ceased to load with every variety of vituperation. The Europeans were, without exception, quite overpowered by emotion; but Mokoum, who was less sensitive to the importance of the loss, retained his self-possession.

"Perhaps even yet," he said, "something may be done to assist you in your perplexity. These chacmas are always careful of their stolen goods, and if we find the robber we shall find the register with him. But time is precious, and none must be lost."

The bushman had opened a ray of

hope. Palander revived at the suggestion; he arranged his tattered clothes as best he could, and having accepted the jacket of one sailor and the hat of another, declared himself ready to lead his companions to the scene of his adventure.

They all started off toward the west, and passed the night and the ensuing day without any favorable result. In many places, by traces on the ground and the bark of the trees, the bushman and the pioneer recognized unmistakable vestiges of the baboons, of which Palander affirmed that he was sure he had seen no less than ten. The party was soon on their track, and advanced with the utmost precaution, the bushman affirming that he could only count on success in his search by taking the chacmas by surprise, since they were sagacious animals, such as could only be approached by some device of secrecy.

Early the following morning one of the Russian sailors, who was somewhat in front, perceived, if not the actual thief, yet one of his associates. He prudently returned to the little troop, who came at once to a halt. The Europeans, who had resolved to obey Mokoum in everything, awaited his instructions. The bushman begged them to remain in quietness where they were, and, taking Sir John and the pioneer, turned toward the part of the wood already visited by the sailor, carefully keeping under shelter of the trees and bushwood.

In a short time the bushman and his two companions caught sight of one chacma, and almost immediately of nine or ten more, gamboling among the bushes. Crouching behind a tree, they attentively watched the animals. Their short tails did not reach the ground, and their powerful muscles, sharp teeth, and pointed claws, rendered them formidable even to the beasts of prey. These chacmas are the terror of the Boers, whose fields of corn and maize, and occasionally whose habitations, are plundered by them.

Not one of the animals had as yet espied the hunters, but they all continued their sport, yelping and barking as though they were great, ill-favored dogs. The important point for determination was, whether the actual purloiner of the missing documents was there. All doubt was put aside when the pioneer pointed out a chacma wrapped in a rag of Palander's coat. Sir John felt that this creature must be secured at any price, but he was obliged to act with great circumspection, aware, as he was, that a single false movement would cause the whole herd to decamp at once.

"Stay here," said Mokoum to the pioneer; "Sir John and I will return to our companions and set about surrounding the animals; but meanwhile do not lose sight of them."

The pioneer remained at his post, while Sir John and the bushman returned to Colonel Everest. The only means of securing the suspected culprit was to surround the whole troop. To accomplish this, the Europeans divided into separate detachments; one composed of Strux, Emery, Zorn, and three sailors, was to join the pioneer, and to form a semicircle behind him; and the other, comprising the Colonel, Mokoum, Sir John, Palander, and the other three sailors, made a detour to the left, in order to fall back upon the herd from the other side.

Implicitly following the bushman's advice, they all advanced with the utmost caution. Their guns were ready and it was agreed that the chacma with the rags should be the aim for every shot.

Mokoum kept a watchful eye upon Palander, and insisted upon his march-

ing close to himself, lest his unguardedness should betray him into some fresh folly. The worthy astronomer was almost beside himself in consternation at his loss, and evidently thought it a question of life or death.

After marching with the frequent halts which the policy of being unobserved suggested, and continuing to diverge for half an hour, the bushman considered that they might now fall back. He and his companions, each about twenty paces apart, advanced like a troop of Pawnees on a war-trail, without a word or gesture, avoiding even the least rustling in the branches. Suddenly the bushman stopped; the rest instantly followed his example, and standing with their fingers on the triggers of their guns, were ready to raise them to their shoulder. The band of chacmas was in sight, they were already sensible of some danger, and seemed on the lookout. The great animal which had stolen the registers had, to their fancy, an appearance of being especially agitated. It had been already recognized by Palander, who muttered something like an imprecation between his teeth.

The chacma looked as if it was making signs to its companions; some females, with their young ones on their shoulders, had collected in a group, and the males went to and fro around them. The hunters still drew on, one and all keeping a steady eye direct toward the ostensible thief. All at once, by an involuntary movement, Palander's gun went off in its hands. Sir John broke out into an exclamation of disgust, and instantly afterward fired. Ten reports followed, three chacmas lay dead on the ground, and the rest, with a prodigious bound, passed over the hunters' heads.

The robber baboon alone remained; it darted at the trunk of a sycamore, which it climbed with amazing agility, and disappeared among the branches. The bushman, having keenly surveyed the spot, asserted that the registers were there concealed, and fearing lest the chacma should escape across the trees, he calmly aimed and fired. The animal, wounded in the leg, fell from branch to branch.

In one of its fore-claws it was seen to clutch the registers, which it had taken from the fork of the tree.

At the sight, Palander, with a leap like that of a chamois, darted at the chacma, and a tremendous struggle ensued. The cries of both man and beast mingled in harsh and discordant strain, and the hunters dared not take aim at the chacma for fear of wounding their comrade. Strux, beside himself with rage, shouted again and again that they should fire, and in his furious agitation he would probably have done so, if it had not been that he was accidentally without a cartridge for his gun, which had been already discharged.

The combat continued; sometimes Palander, sometimes the chacma, was uppermost. The astronomer, his shoulders lacerated by the creature's claws, tried to strangle his adversary. At last the bushman, seizing a favorable moment, made a sudden dash, and killed the ape with one blow of his hatchet.

Nicholas Palander, bleeding, exhausted and insensible, was picked up by his colleagues; in his last effort he had recaptured his registers, which he was found unconsciously grasping to his bosom.

The carcass of the chacma was conveyed with glee to the camp. At the evening repast it furnished a delicious meal to the hunters. To all of them, but especially to Palander, not only had the excitement of the chase quickened their appetite for the palatable dish, but the relish was heightened by the gratifying knowledge that vengeance was satisfied and the records saved.

The work was nearly ended.

CHAPTER XXIII

The Task Accomplished

PALANDER'S wounds were not serious; the bushman dressed the contused limbs with herbs and the worthy astronomer, sustained by his triumph, was soon able to travel. Any exuberance on his part, however, was of short duration, and he quickly became again engrossed in his world of figures. He only now retained one of the registers, because it had been thought prudent that Emery should take possession of the other. Under the circumstances, Palander made the surrender with entire good humor.

The operation of seeking a plain suitable for a base was now resumed. On the 1st of April, the march was somewhat retarded by wide marshes; to these succeeded numerous pools, whose waters spread a pestilential odor; but, by forming larger triangles, Colonel Everest and his companions soon escaped the unhealthy region.

The whole party were in excellent spirits. Zorn and Emery often congratulated themselves on the apparent concord that existed between their chiefs. Zorn one day expressed his hope to his friend that when they returned to Europe they would find that peace had been concluded between England and Russia, so that they might remain as good friends as they had been in Africa.

Emery replied that he acquiesced entirely in the hope; in days when war is seldom long protracted they might hope all would be terminated by the date of their return.

Zorn had already understood from Emery that it was not his intention to return immediately to the Cape, and expressed his hope that he might introduce him to the observatory at Kiew. This proposal Emery expressed his desire to embrace, and added that he should indulge the expectation that Zorn would at some future time visit the Cape.

With these mutual agreements they made their plans for future astronomical researches, ever reiterating their hopes that the war would be at an end.

"Anyhow," observed Emery, "Russia and England will be at peace before the Colonel and Strux; I have no trust in any reconciliation of theirs."

For themselves, they could only repeat their pledges of mutual good-will.

Eleven days after the adventure with the chacmas, the little troop, not far from the Zambesi Falls, arrived at a level plain several miles in extent, and perfectly adapted for the establishment of a base. On the edge of the plain rose a native village, composed of a few huts containing a small number of inhabitants, who received the Europeans kindly. Colonel Everest found the proximity of the natives very opportune, since the measurement of the base would occupy a month, and being without wagons, or any material for an encampment, he would have had no resource but to pass the time in the open air, with no other shelter than that afforded by the foliage.

The astronomers took up their abode in the huts, which were quickly appropriated for the use of their new occupants. Their requirements were but small; their one thought was directed towards verifying their calculations by measuring the last side of their last triangle.

The astronomers at once proceeded to their work. The trestles and measuring rods were arranged with all the care that had been applied to the earliest base. Nothing was neglected; all the conditions of the atmosphere, and the readings of the thermometer, were taken into account, and the Commission, without flagging, brought every energy to bear upon their final operation.

The work, which lasted for five weeks, was completed on the 15th of May. When the lengths obtained had been estimated and reduced to the mean level of the sea at the temperature of 61° Fahrenheit, Palander and Emery presented to their colleague the following numbers:

	Toises.
New bases actually measured..	5075.25
The same base deduced trigonometrically from the entire series.....	5075.11
Difference between the calculation and the observation....	.14

Thus there was only a difference of less than 1-6 of a toise, that is to say, less than ten inches; yet the first base and the last were six hundred miles apart.

When the meridian of France was measured from Dunkirk to Perpignan, the difference between the base at Melun and that at Perpignan was eleven inches. The agreement obtained by the Anglo-Russian Commission was still more remarkable, and thus made the work accomplished in the deserts of Africa, amid dangers of every kind, more perfect than any previous geodetic operation.

The accuracy of this unprecedented result was greeted by the astronomers with repeated cheers.

According to Palander's reductions, the value of a degree in this part of the world was 57,037 toises. This was within a toise, the same as was found by Lacaille at the Cape in 1752; thus, with the interval of a century, the French astronomer and the members of the Anglo-Russian Commission had arrived at almost exactly the same result. To deduce the value of the *mèter*, they would have to wait the issue of the operations which were to be afterward undertaken in the northern hemisphere. The value was to be the 1/10,000,000 of the quadrant of the terrestrial meridian. According to previous calculations the quadrant, taking the depression of the earth into account, comprised 10,000,856 *mèters*. Whether this was correct the subsequent labors of the Commission would have to decide.

* * * * *

The astronomers had now entirely finished their task, and it only remained for them to reach the north of the Zambesi, by following inversely the route afterward taken by Dr. Livingstone in his second voyage from 1858 to 1864.

On the 25th of May, after a somewhat laborious journey across a country intersected with rivers, they reached the Victoria Falls. These fine cataracts fully justified their native name, which signifies "sounding smoke." Sheets of water a mile wide, crowned with a double rainbow, rushed from a height twice that of Niagara. Across the deep basalt chasm the enormous torrent produced a roar like peal after peal of thunder.

Below the cataract, where the river regained its calmness, the steamboat, which had arrived a fortnight previously by an inferior affluent of the Zambesi, awaited the astronomers, who soon took their places on board.

There were two to be left behind. Mokoum and the pioneer stood on the bank. In Mokoum the English were leaving, not only a devoted guide, but one whom they might call a friend. Sir John was especially sorry to part from him, and had offered to take him to Europe, and there entertain him as long as he pleased to remain. But Mokoum had previous engagements; in fact, he was to accompany Livingstone on the second voyage which the brave traveler was about to undertake up the Zambesi, and Mokoum was not a man

to depart from his word. He was presented with a substantial recompense, and, what he prized still more, the kind assurances of regard of the Europeans, who acknowledged how much they owed to him. As the steamer left the shore to take the current in the middle of the river, Sir John's last gesture was to wave an adieu to his associate.

The descent of the great river, whose banks were dotted with numerous villages, was soon accomplished. The natives, regarding with superstitious admiration the smoking vessel as it moved by mysterious mechanism, made no attempt to obstruct its progress.

On the 15th of June the Colonel and his companions arrived at Quilimane, one of the principal towns at the mouth of the Zambesi. Their first thought was to ask for news of the war. They found that it had not yet come to a termination, and that Sebastopol was still holding out against the allied armies. This was a disappointment to the Europeans, now so united in one scientific object; but they received the intelligence in silence, and prepared to start. An Austrian merchant-vessel, *La Novara*, was just setting out for Suez; in that they resolved to take their passage.

Three days after, as they were on the point of embarking, the Colonel assembled his colleagues, and in a calm voice reminded them how in the first eighteen months they had together experienced many trials, and how they had been rewarded by accomplishing a work which would call forth the admiration of all scientific Europe. He could not refrain from giving expression to his trust that they would feel themselves bound in the common fellowship of a true alliance.

Strux bowed slightly, but did not interrupt the Colonel, who proceeded to deplore the tidings of the continuation of warfare. When he referred to the expected capitulation of Sebastopol, Strux indignantly rejected the possibility of such an event, which no union of France and England, he maintained, could ever effect.

There was, however, it was admitted on all hands, a propriety in the Russians and English submitting to the national status of hostility. The necessities of their position were thus clearly defined, and under these conditions they embarked in company on board *La Novara*.

In a few days they arrived at Suez. At the moment of separation Emery grasped Zorn's hand, and said:

"We are always friends, Michael!"

"Always and everywhere, William!" ejaculated Zorn; and with this sentiment of mutual devotion they parted.

The Commission was dissolved. The great work was complete.

The toise is a French unit of length no longer in general use, being supplanted by the meter. Its length is 2.1315 yards, or 6.3948 feet, or 1.949 meter.

THE END

The Velocity of Escape

By JOE W. SKIDMORE

We have found by long experience that our readers like interplanetary stories. They give a scope for most exciting episodes, and some of our best authors have really, in a sense, made a reputation by this class of work. Mr. Skidmore not only gives us a very good story of the adventures of men on contending space ships, but by introducing plenty of the personal element makes it a truly exciting narration.

Illustrated by MOREY

CHAPTER I

The Falcon Swoops

A VERY much worried group of famous scientists were gathered together in one of the United States government secret underground chambers. The best scientific minds in all the world had been hastily summoned to this important conference. From various countries they had been gathered. Swift airplanes and space cars had been utilized to gather the great group of the world's keenest intellects.

Had the meeting not been considering a mighty problem that concerned the very existence of the world itself, it would have been highly important for one reason alone—the presence of Donald Millstein, famous scientist and adventurer, had been requested by none other than the President of the United States. Just now Millstein was speaking, and the erudite and bearded gentlemen around the council table listened hopefully and attentively.

Millstein was not of the usual type of scientist. He was not aged and bearded; neither was he bespectacled. Quite the contrary, he was young, virile and upstanding. His fine figure and handsome features had stirred the heart of many a fair maid. It is not to record that Millstein aspired to be a Don Juan. Unlimited wealth and early scientific training from a father famed in research had vested Millstein with every advantage of unusual education and physical training. The government had called him before to destroy plots and intrigues against the safety of civilization. Many times he had thundered on flashing wing to distant parts of the globe, there to solve, after incredible adventures, some weird plot against organized society.

"I tell you, Gentlemen," Millstein's voice rang out clear and strong, "this looks like the work of the Falcon to me."

A murmur of excited comment ran around the table. It was quite evident the group did not share Millstein's opinion. The latter's dark eyes flashed as he hastened to confirm his theory.

"It may sound like a crazy theory to you, Gentlemen, but you remember that the Falcon has several times before tried to overthrow our government. He——"

"Who is the Falcon?" interrupted a voice.

"Strange you don't know," said Millstein. "I thought everyone knew about the Falcon. His is a strange, tragic story.

Millstein pulled a group of levers while his eyes watched the reflectoscope. In an instant ten small space cars flashed away on their long journey toward earth.

Verensky is his name; a wealthy Russian scientist. He is tall, incredibly strong, but of an aesthetic type—a dreamer. Some ten years ago, in nineteen hundred and eighty-one, to be correct, he came to this country with a great plan for new laboratories and scientific development. At that time he was an altruist, but the massive brain contained within his herculean body became overworked. He had trouble with our own Internal Revenue Department, that made a heavy income tax lien against the Russian, Verensky. The tax assessment developed into a battle that lingered in our supreme courts. To make the story short, Verensky lost. Stubbornly he refused to pay the amount involved, and the Revenue Department filed a lien against his immense holdings. Finally a part of the Russian's brain snapped. He became a maniac, obsessed with the idea of overthrowing all forms of government; wedded to the idea of destroying all organized society. He disappeared. For the last ten years no one has known of his whereabouts, but his evil influence and machinations have been felt. You know full well his handiwork in the poison fogs that spread over Europe some years ago. I had a part in overcoming that terror. You will remember that the United States air forces cooperated with me in finding his planes, that were spreading the deadly fogs.

VERENSKY, or the Falcon, as he smugly calls himself, is a menace to the world. His distorted brain will never stop working until he has destroyed the world, or has been destroyed himself. You, Gentlemen, remember, too, the great panic of nineteen hundred and eighty-five, when the clever Falcon devised a powerful machine that set up peculiar, powerful vibrations to destroy the atomic structure of gold. He built many of these machines and placed them in the great financial centers of the world. You recall the horrible panics when the monetary value of gold went to nothing, because the gold stored in vaults, banks and jewelry stores dissolved into a gray powder when it came within the influence of the disintegrating vibrations. Each machine that Verensky made had an effective radius of ten miles.

"You perhaps recollect that I was instrumental in locating these machines and destroying them. At that time I was wounded in a duel with the Falcon. He was in his fast monoplane. We had quite a dog fight at twenty thousand feet. He shot me in the shoulder and brought me down. About twice a year I receive a message signed 'The Falcon.' Here, let me read this one that came only a week ago."

Donald Millstein had spoken frankly without any hint of boastfulness. The group knew that Millstein was speaking only the simple truth. They waited eagerly for him to continue. Millstein glanced around the assembly as he unfolded a paper and read.

"To my enemy, Donald Millstein. Thrice you have thwarted me in my attempt to remove a cruel government from the earth. The Falcon is swooping again. Beware!"

"Millstein, where do you think the Falcon keeps in hiding?"

"I have a theory, Gentlemen, that the Falcon lives in a giant space car far out beyond the stratascope. There his evil mind plans his schemes of revenge, and he must have a marvelous laboratory and trained assistants."

"But all space ships have been searched. Each one is numbered and well known," broke in the stubborn voice again.

"Quite true," agreed Donald, "but remember the Falcon is a resourceful genius. Then, too, perhaps he lives in some vast cavern of the earth. Lately I have been conducting some experiments with my radio apparatus to see if I can

locate his sending stations. Such a scientist as the Falcon will, of course, have powerful sending and receiving stations. His uncanny wisdom and devilish resources are simply amazing. I say this to you, Gentlemen; I have the feeling that the Falcon is listening to our conversation this very moment."

An amazed murmur circled the table, and all stared incredulously towards the young scientist.

"Now, Gentlemen, as to this terrible calamity that is before us. We have discovered lately that the oxygen surrounding the entire earth is becoming diffused, or shall we say thinning out. In other words, something is happening to our oxygen, and human life cannot exist without this precious element. In many sections of the world malignant plagues of consumption and other lung diseases are increasing in terrific epidemics. Even now in this room, all of us are breathing heavily and swiftly in order to absorb enough oxygen for our lungs.

"THE three chief gases of our atmosphere are oxygen, nitrogen and water vapor. The atoms of oxygen and nitrogen have plenty of elbow room in which to dart about. Although they frequently collide with each other, they develop a very great speed. We know that heat is due to the degree of nervousness of these atoms, or groups of atoms. The air that we inhale into our lungs is full of swiftly moving protons and electrons. Let us imagine air one hundred degrees below zero, Fahrenheit. In this condition the atomic motions would be very much more sluggish than they are in the air we are now breathing. Stretch our imaginations a bit further and imagine the air so cold that electrons did not revolve at all. This temperature would be approximately four hundred and sixty-nine degrees below zero. This complete lack of heat is the absolute zero.

"In the case of the atmosphere in this secret room, far below the surfaces of the earth in the secret tunnels of the government, our temperature is about thirty-two degrees Fahrenheit. Rather chilly. The small particles of oxygen we are now breathing are bouncing from one another with an average speed of about two miles per second. This, however, is only the average velocity. Many atoms of oxygen strike, bounce and rebound again with a speed many times greater. If we would heat this room up, that speed would increase. It's a curious fact that all atoms do not possess the same speed when heated to the same degree. Oxygen, nitrogen and water vapor, which, as I have stated before, are the chief three gases of our air, all behave about the same. On the other hand, helium gas atoms will bounce from one collision to another with about twice their velocity. In fact, some helium atoms have a speed of twenty-five miles per second. A cannon ball goes up in the air with tremendous force. It leaves the earth at the rate of less than a mile per second, and then because of gravity, returns to earth. But if the cannon ball were to be shot into the air with an initial velocity of about seven miles per second, it would never return. For countless millions of years it might wander through space like a meteoroid.

"Now, Gentlemen, I'm getting to the point of my theory. If a cannon ball could be shot into the air with a velocity of more than seven miles per second, and never return to earth, what is true of a cannon ball is also true of an atom. If after thousand and millions of collisions, an atom finds itself in the upper air, it may be going at so great a speed that the gravity of earth cannot recall it. Earth is so large that no atom can bounce away unless it has a speed of more than seven miles a second. Our most valuable gases, oxygen, nitrogen and water vapor, are

slow and seldom exceed that critical speed.

"Even at the temperature at which water freezes, a hydrogen atom has an average speed of more than seven miles per second and, of course, many hydrogen atoms would have a far greater speed. To illustrate more clearly, let us consider the planet Mercury. A cannon ball with the velocity of only two miles per second would leave that planet forever. This state of affairs is due to the smallness of Mercury. Its gravity force is so slight that a body would fall only four feet during the first second. The blinding sunlight of Mercury would make an oxygen atom nervous. Its excitable nature would cause billions of its comrades to dart about, collide and bounce at a speed much in excess of two miles per second. Thus it was that Mercury lost its precious air countless millions of years ago. Even lost all the gases, which from time to time have been emitted by its volcanos.

"On the planet Mars an atom of air would only have to possess the velocity of more than three miles per second to bounce away and never return. On Venus, 'The Velocity of Escape' is approximately seven miles."

"I cannot understand," interrupted one of the scientists, "what this has to do with the Falcon."

"IT means just this," continued Millstein. "Verensky is a most dangerous criminal, an insane man obsessed with the idea of wiping out the earth. You must not underrate his powers. In some manner this insane genius has developed a process, perhaps a machine, that emits exciting rays that increase the speed of the atoms of oxygen, causing them to act as the hypothetical cannon ball. Already my laboratories are conducting tests."

"You mean," broke in Doctor Benson, a famous scholar, "that our oxygen is flying away from the earth?"

"That is exactly what I mean," insisted Millstein. "Perhaps it's been going on for a year or more, and, as you know, we are just beginning to feel the horrible effect of the thinning out process of the air."

A tall figure at the head of the table rose; the President of the United States. Up to this time, that leader of a mighty nation had not spoken. His calm eyes swept over the gathering.

"Donald Millstein, I have listened and believe in your theory. Before, in emergencies, the government has called and depended upon you. I ask you to take full charge of this investigation. The government is behind you. I am remembering at this moment your past services, and pledge you unlimited support. What can the government do to help you?"

It was typical of Millstein that he ignored completely the fine compliment and praise from the greatest man in the land. His whole mind was concentrated to the task of solving the mighty problem. People all over the world, gasping for breath, were breathing his name, their words a hopeful prayer.

"Mr. President, I thank you, and I will call upon your Department of Chemistry and Science for their best man; and if an idea I have proves to have merit, I shall ask you for power to call out the space fighters of our Air Navy."

"It is granted," stated the President.

CHAPTER II

Atomic Solar Systems

DON MILLSTEIN left the meeting and was carried in a fast government automobile to the nearest flying field, where he had left his special plane. Millstein was most courageous, but the iron-nerved secret service operator who tooled the powerful ar-

mored car through Washington traffic gave Don many a thrill. A few moments at the airport, and Millstein was thundering through the air at three hundred miles per hour.

Three hours later he was in his wonderful laboratory, well hidden among bleak Vermont hills. Jack Cromwell, trusted assistant, who always accompanied Millstein on desperate flights and dangerous espionage, was waiting anxiously.

"Glad to see you, Millstein. We're getting a mysterious message on the radio that's intended for you. It's been repeated several times, and who do you think is sending it?"

"The Falcon?"

"Yes, Chief, and here's what he says."

"Never mind what he says, Jack. Go back to the radio and see if you can find if the message is coming from near-by or from space. Wait a minute. What does the message say?"

Jack Cromwell flashed an amused grin as he read aloud from a slip of paper.

"To Donald Millstein. Beware, my enemy. Do not attempt to thwart my plans. From the Falcon."

"That settles it," stated Millstein. "There's no doubt of it. The Falcon is back of this terrible oxygen starvation. After you work with the radio, come to the laboratory. You and I are going to do some microscopic work."

For many hours Millstein and his trained assistants did not rest. Involved experiments were conducted. Tired, weary eyes strained through powerful lenses. From time to time Millstein, whose eyes were fairly glued to his instrument, would call out details and instructions to his assistants.

"Come here, Cromwell," from Millstein, after a long, studied silence. "Look at these films we've developed."

A microscopic motion picture projection machine was fitted up and so focussed and arranged that the diminutive solar system of an atom of oxygen was thrown on the screen. The projection machine was then slowed down so that it barely revolved. During the taking of the pictures, the camera had been operated at a fearful velocity. A most remarkable miniature solar system was projected on the screen. Worlds—planets revolving about each other in fixed orbits!

In spite of the fact that the machine had slowed down their movements by many thousand times, always the whirling pairs of the electrons fairly raced on the screen.

"There you are, Cromwell. Look at that small solar system all by itself. A nucleus of oxygen. See how the electrons fairly whirl. Much too fast for normal oxygen. Some kind of ray or a magnetic or electrical influence is increasing the normal speed of the oxygen atoms."

"Well," mused Jack, who always saw humor in every situation, "perhaps the Falcon has done something to set them on a spree."

"Whatever it is, Jack, it's most serious. The world is about to be deprived of its oxygen and will soon become a dead, hopeless sphere. As you perhaps know, oxygen is the eighth element. Its atomic number is eight, and its atomic weight is sixteen. Therefore each nucleus of oxygen has eight free or orbital electrons and eight bound electrons.

"There are only a few of the known elements that are so exactly and evenly divided as to free electrons and bound electrons. Perhaps this is the reason that it is possible for the Falcon to accelerate by some means the speed of the electrons in this element.

"BY the way, Cromwell, did I ever give you this very important rule? To discover the make-up of any element, take the full number of the atomic weight. That represents the number of

protons in the nucleus. For instance, gold has one hundred and ninety-seven of them. Now the number of free electrons is represented by the atomic number, in this case of gold, seventy-nine. The nucleus, therefore, consists of one hundred and ninety-seven protons. Of the electrons within an atom of gold, seventy-nine would be free or orbital electrons, while one hundred and eighteen would be bound electrons."

Trained assistants at Millstein's direction next placed an atom of oxygen so that it could be bombarded with high voltage. This device, called an "Alpha Ray" machine, projected charges of several million volts of potential directly into the little solar system of the oxygen nucleus.

Millstein, worn and tired, sighed at the result.

"It's no use. It's not electricity that is speeding up the atoms. See. That little solar system was exploded in a normal manner, and we know for certain that it's not a rise of temperature that's affecting their speed. Let's try a magnetic influence."

It took hours to make this test, but it revealed nothing. The orbital electrons of the oxygen atoms performed normally, except that they continued to rotate at their mad, unusual speed.

"Do you suppose," from Cromwell in a studied tone, "that the positive and negative charges of the electrons have been reversed by some means?"

"I thought of that," replied Millstein. "It's my theory that if charges were reversed, the atoms would not have acted as they did under the test of the voltage bombardment. No—it's not that."

Just then there was an interruption from a trusted assistant.

"Mr. Millstein, here is a very important message that just came from government headquarters."

"Bad news, Chief?" asked Jack anxiously.

"Yes, it is." Millstein's face was slightly pale. "This message from the government states that thousands are dying in the regions of high altitudes. Urges me to speed up investigation. The message is more of a prayer than a command. I tell you, Jack, things are desperate. I'm certain now that the Falcon is back of all of this. By the way, Jack, when his message came in on the radio, do you think the sending station was close or far?"

"It must have been from a great distance, for the reception wavered, and was very faint until I amplified it, and it had a great deal of static."

For a moment Millstein remained silent. Then a light broke over his face.

"Do you know, Jack, I believe that if we could find the Falcon and net him, this problem might be solved. By Jove! I'm sure he's sending those messages from space. I'll bet he has a space car of immense size and practically lives in it. That's why the best brains in the world have been unable to find him."

"Great Cosmos!" shot out Cromwell, "Do you mean to say that one scientific crook can lick the whole world?"

Millstein sprang erect with an excited exclamation as Cromwell spoke.

"COSMOS. Why do you say 'Cosmos'? Don't you get it? Cosmic rays!" Millstein's voice rose to a high, excited pitch as he went on. "Cosmic rays are considered by some scientists to be the signals sent out through the ether, announcing the continuous creation of the heavier metals out of the lighter. Many years ago it was thought that cosmic rays originated from the fierce energy of the sun, generated in that mighty globe of gas by the exploding atoms that provide its boundless energy. Later it was found, however, when machines called electroscopes were lowered into deep lakes, that the cosmic rays still had their effect. This

machine was originally designed by the famous Dr. Robert A. Millikan. His apparatus was composed of delicate quartz fibers so arranged that when the fibers were charged with one kind of electricity, they would repel and remain apart, but as soon as the cosmic rays influenced them, penetrating the shell of the electroscope, the electrical charge of the fibers was knocked off in proportion to the effect of the rays, causing the quartz fibers to come close together. Then, by measuring the rate of the collapse of the fibers and the discharge of the electricity from them, the great Millikan was able to prove the strength of cosmic rays at any moment. He made the astounding discovery that these rays have the same effect at night as in the daytime, thus proving that the rays do not originate from the mighty energy of the sun.

"Millikan also found out in his experiments that some rays were more penetrating than others, which proved that cosmic rays had different characteristics. Tests showed that some of these rays could pass through seventeen feet of lead. Owing to the research of the magnificent scientist, it was decided that cosmic rays came from interstellar space. Later, with Millikan still laboring at his devices, it was discovered that the cosmic rays are divided very distinctly into several distinct bands or groups of the spectrum. Then it was proven that each of the spectrum bands of the cosmic rays corresponds to the production of a particular kind of atom, as when the atoms of helium gas are being built in sky space there is released a definite band of cosmic rays, called the helium cosmic ray bands. Again, when an oxygen atom is being made, another sort of cosmic ray is discharged. The generation of silicon and iron atoms causes the emission of very different and distinct ray bands.

"Now nitrogen and carbon are so close to oxygen in their atomic pattern, the structure of their electrons within each of their atoms, that the cosmic rays, due to their atom building, are included in the oxygen cosmic rays. So you see, Cromwell, it may be that the study of nitrogen and carbon will help us to solve the secret mystery.

"WE must look into an atom of hydrogen. Hydrogen atoms are the fundamental bricks of the physical universe. They are the lightest of any atom and the simplest in construction. The simplest of all elements is hydrogen gas, in which one electron revolves around a nucleus of one proton. Let us compare this atom of hydrogen gas to a solar system, that consisted of just the Sun and Mercury.

They would be approximately the same as to their relative sizes, distances apart, rotations and orbits.

"But to make this short, you know that scientists found only a few years ago that the cosmic rays are "photons," such as light and X-rays, rather than electrons, and that the cosmic rays are not generated in the local astronomical complexes—the solar system and the Milky Way—but are born from atomic disturbances in the unknown space regions, millions of light years away."

Cromwell had been gazing at Millstein in adoration during the technical discourse.

He suddenly spoke.

"Chief, I believe you've got it.

"The Falcon is fooling with the cosmic rays."

"Yes," muttered Millstein, his mind filled with a thousand details. "We're going to fly back to Washington at once. Then we're taking my space ship, 'Nemesis,' out into space. We're going to look for the Falcon.

"He's doing something to the cosmic days, and that is causing all of the trouble that is over us."

CHAPTER III

The Space Trail

JACK CROMWELL was an excellent pilot, and while they were flying back to the government port for space ships, Millstein managed to get two needed hours of sleep. It was well that Cromwell was a skilled pilot and that the sturdy little plane was equipped with a very powerful motor, for he found difficulty in maintaining any safe altitude in the thin air. Finally, however, after making proper signals, they circled and came to a perfect three-point landing.

For miles great hangars stretched, towering high in the air. Great steel towers rose at different places. These towers were built for the launching of space ships. These elongated derricks acted as guides to launch space ships into the blue vault of the sky.

While flying from their laboratory, Cromwell, at Millstein's direction, had radioed ahead to government headquarters, requesting that two of the finest and fastest United States space fighters be assigned to Millstein. The government had wired back its instant approval, with the information that the two ships and crews would be ready when Millstein arrived.

The scientist and his assistant were soon in the great hangar that housed Millstein's personal space ship, the 'Nemesis.' Millstein had spent years developing the space ship, the fastest man-made thing that ever rocketed through space. The craft possessed new and strange, powerful weapons, that were known only to Millstein and a few of his highly trusted assistants. Many times he had used this craft on dangerous interplanetary expeditions, and it was a mark of distinction and favor that he could house his private ship at the government port.

In the control room Millstein gave out detailed instructions while the ship was being checked with painstaking care. Millstein was in a studious mood.

"You know after all, Jack," he said quite dubiously, "we're going out on rather a wild goose chase. It's just a hunch."

"Somehow I feel, Chief, that we're on the right track. Your hunches never fail."

Word came that the two government scouts were ready to take off any second. Millstein, connected to the two government space ships by radio telephone, gave them detailed instructions as to their flight and course. Then he turned his eyes to the control board of his space car. His hands lovingly caressed the levers, instruments and gauges, as a skilled artist at a piano.

"Ready!" snapped Millstein in the mouthpiece of the phone.

With a careful glance at the gauges, he pulled a lever. The top of the great hangar opened up, and a steel guide slid noiselessly, high into the air; a guide such as a tremendous sky rocket would use for its initial impetus.

"Power!" snapped Millstein, pulling another lever. For a moment the two felt as though some relentless force was squeezing their bodies to an unbearable degree. Acceleration was taking its toll.

"Well, Jack, we're beyond the stratascope. Do you realize that it did not take as much power as usual to leave the atmosphere? It must be thinning very rapidly."

"What are your plans?"

"I have a theory that if the Falcon is in some way affecting the cosmic rays, then he will be only a few thousand miles from the surface of the earth; so I'll tell you what I'm going to do. I'm going to start making circles around the earth at about one thousand miles from its surface. Our first circle we'll make at a

velocity of five thousand miles per hour. Then we'll proceed outward to an additional one thousand miles from the surface of the earth and circle the globe again. Next time we'll run the speed up to ten thousand miles per hour. Don't you see, Jack, that if we keep circling the globe and gradually work outward, increasing the velocity of our flight, I figure that in twenty hours we'll have reached a point where the Falcon might be located? This way we cannot miss him. Provide the men in the forward lookouts with the high-powered telescopes, and tell them to search the heavens at all times. Keep our best men at the radio detectors to see if they can locate any ship. We'll investigate every ship we meet. I have full government authority, and the government has asked the other planets to cooperate in our need. Venus has agreed to have her space craft investigated."

"Chief, it's a big job to search the whole universe."

"That fiend is some place in our own planetary system," insisted Millstein resolutely, "and I'm going to find him."

HOURS passed, and the "Nemesis" was many thousand miles from the earth, which now glowed like a moon. Both Jack and Millstein had obtained a needed rest, leaving the control of the ship to efficient officers.

"Cromwell, are the two government ships keeping in close contact with us?"

"Yes, Chief. They're directly in our rear. Number seven-H-five is a hundred miles to our right, and Number seven-H-six is two hundred miles in the rear to the left. We are at all times in constant communication with them. They report that their ships are operating in wonderful shape, but say they're running at full power of their atomic tubes to keep up with us. We can't increase our speed unless we want to leave the ships behind."

"Do you know, Cromwell," there was a mysterious light in Millstein's eyes, "I love my 'Nemesis.' I believe she is the fastest thing that was ever built by man. Some day I'm going to build a projectile that will fly at the speed of light."

"But no one will ever be able to fly at the speed of light, for you know that Einstein, that great scientist who lived many years ago, was the first to discover that if an object were to travel at the speed of light, it would cease to exist."

"How can anything cease to exist?" argued Millstein. "There's no limit to the smallness of things, as there is no limit to the largeness of things. You and I know we're now traveling at a velocity that in a slight degree reduces our size that we possessed on earth. We don't feel any discomfort, and I believe that when man comes to travel at the speed of light, he will continue to diminish in size but will suffer no ill effect, and not realize the difference; his surroundings would be proportionately decreased in mass."

"You're talking too deep for me, Chief. But say, there's one thing I do want to know. You've been working for months on this ship, secretly installing some new weapons. Tell me about them. This craft already had the most powerful armament in the universe."

"I'm glad you mentioned that, Cromwell. Here's a little device that's going to spring a surprise on the Falcon. It has sights like the turret guns of the old, obsolete battleships. When these levers are moved, a tube is thrust from the nose of our ship and can be pointed at any other space ship or object in space by merely aligning the pointer on this smoked glass against the reflected object."

"Very ingenious," agreed Cromwell, "but what good does it do?"

"Well, it's connected to powerful motors and transformers in the engine rooms of our ship. When you pull this lever," Millstein indicated a small lever

like a trigger of the obsolete Colt 45, "it releases a ray that literally bathes itself over any space ship at which it might be pointed. This energy ray reverses the direction of the flow of electrical energy through the protons and electrons in any element it caresses. It will disintegrate some of the denser metals almost instantly, setting up a "discontented" element condition among the electrons and protons, such as exists in radium, except that the process of disintegration would be greatly speeded. Naturally, too, it would have the lesser but devastating effect of instantly burning out all the enemy's electrical circuits and motors—radios—in fact all electrical equipment. I am anxious to try this device out on the Falcon, Cromwell. There was no place on earth I could make a safe test without damaging too much surface."

"Well!" exclaimed Cromwell, wide-eyed, "you have got a surprise for the Falcon! I don't know what earth would have done the last ten years without your talent. You've developed practically every new weapon they have."

"NEVER mind the bouquets. I want to tell you about this weapon here," said Millstein, pointing to a device, the controls of which were similar to the first. "This operates in practically the same manner, except that I call it my expansion ray. When its fearful energy floods itself over any element, it causes the orbits of the electrons within that element to suddenly enlarge the circles of their orbits many million times. This, of course, has the same effect as an explosion of T.N.T. Unfortunately, so far I've been unable to affect anything but the electrons within an iron nucleus, but of course almost every metal in a space ship has some iron in its composition. So if we can maneuver our projection tubes to bathe this ray over a space ship, and explode all the billions of iron nucleuses within that space ship, the whole structure is certain to fall apart."

"But there are lots of elements used in a space ship, such as copper, aluminum, lead and others," argued Cromwell. "These have no iron in their composition."

"Yes," agreed Millstein, "but all those elements are always fastened to steel, which has iron content. Think of the steel shell of a space ship going to pieces."

"You're right. The expansion ray is going to be tough for the enemy. Have you any other nice little things up your sleeve?"

"Just two more," answered Millstein. "This third device, which points its projection tube similar to the others I have explained, shoots out vibrations which travel on a beam of light. When this beam, carrying the deadly rays, strikes a space ship, it has a powerful effect on the atomic structure of all elements. I don't know just how I discovered it. Stumbled on it quite by accident, but this ray, combined with the vibration, instantly stops the orbits of electrons in any element. This of course produces close to absolute zero, and unless the occupants of a space car had something to overcome these rays, they would be frozen instantly."

"You've been working lately. Why have you been keeping these things secret?"

"I wanted to have a chance to try them first."

"Well," grinned Cromwell, "let's find the Falcon and test 'em out. What's the other pop-gun you were talking about?"

"This apparatus produces vibrations so shrill and intensely rapid they will penetrate many feet of most elements and instantly paralyze the brain of any human or living creature. I have managed to project it on a beam of light, and by turning this other switch, I can produce the vibrations all around our space ship, but of course in using this latter method,

the vibrations weaken very rapidly as they widen into space. This device is a last card to play. Suppose, for instance, we could succeed in darting our ship close to an enemy, and flooded them with these vibrations. I calculate that this weapon will be active up to a ten mile radius around our ship."

"I've heard enough technical stuff," begged Cromwell. "You've got my brain going around in a whirl. How far are we now from earth?"

"We've made our tenth revolution," stated Millstein, "and we're only a hundred thousand miles from earth. Let's step into the observation room. The heavens are unusually clear. No cosmic clouds; perhaps we can do a bit of adventuring with the telescopes."

The two seated themselves in comfortable chairs, their eyes adjusted to powerful glasses.

"THERE'S a sight for you, Cromwell. Look at that smaller group of the clouds of Magellan. Those billions of stars are a hundred thousand light years away from earth. They appear as a little cloud that had blown away from the Milky Way. Once I was on an expedition at the South Pole, and on very clear nights that group was visible to the naked eye. If all the lights in that group were concentrated in one point, they would be about as bright as the North Star. Their faintness is due to the enormous distance, yet thousands of stars in that cloud of billions of stars are two hundred thousand times brighter than our sun. If the sun suddenly acquired such brightness, all life on earth would be instantly burnt to a crisp, or the earth and all on it might be vaporized."

"Very interesting," snorted Cromwell, "but we're out here to find the Falcon."

"Oh, I know you're anxious for a genuine scrap, but that will come soon enough. There's a sight you mustn't miss, —the great star cluster of Hercules. Let me point your glass. What a magnificent sight! From earth these thousands and thousands of stars that make up the clustre of Hercules appear as a single very blurred star. Just think, Jack. The light, by which we see these stars at this moment, left the cluster before the Cro-Magnon race entered Europe and began to draw his wonderful pictures of bison and horses in the famous caves of France. The light that's leaving that cluster now, and starting on its long journey towards earth, will meet our remote descendants in the year Thirty-eight thousand. I wonder, Jack, what kind of a wonderful race those light beams from Hercules will find."

"I suppose it's hopeless to try and get you to talk about anything but scientific things," sighed Cromwell. "I'd rather talk about the Falcon." Cromwell knew even though Millstein was discoursing on scientific matters of a technical nature that his keen brain was shrewdly analyzing and testing every theory relating to the problem at hand. This was their traditional way of working together on a difficult problem. Cromwell had learned by long experience to fall into Millstein's mood. It seemed to stimulate the scientist's brain to give out information.

"Say, Chief, in the laboratory the other day, you spoke about photons. What are photons?"

"Well, Cromwell, I guess you've got me cornered at last. I've said enough to you about cosmic rays for one time, but photons are closely associated with cosmic rays, light and color. We scientists are still groping at the bottom of a vast sea of yet undiscovered wonders. The simplest way to put it would be to say that photons, sometimes called "quanta," are a series of light waves, consisting of countless billions and billions of tiny bullets of energy. Laboratory experiments

have proven that the difference between violet and red color is in the number of microscopic waves of light, which enter your eyes in a second of time. If seven hundred and fifty-six millions of millions enter your eyes in a second, your nerves are affected in such a way that you call the sensation violet. These waves cannot be seen in a microscope. For your edification, my embryo scientist, the number of waves per inch in each color in the rainbow has been counted. Fifty-five thousand waves to the inch give us the sensation of blue. Forty-eight thousand vibrations, green; forty-four thousand, yellow; thirty-eight thousand, red. When the waves become so long that less than about thirty-three thousand occur, we would be unable to see them. For example, alcohol flame does not send out waves that can make any but a minute impression on the nerves of the eyes. Invisible light also comes at the other extreme, the ultra-violet, where the waves are so short and crowded together they don't give our eyes any sensation at all. You can compare this to the piercing shrieks of some laboratory apparatus, or some insects that produce vibrations so shrill that they don't affect our eardrums at all. If the waves of color are so short it takes over sixty-six thousand of them to make an inch, they are totally invisible to our eyes, and are called ultra-violet.

"Thus it has been that scientists, searching the void with their telescopes, have been able to tell from the various colors of the spectrum out in space just how the cosmic rays are vibrating, and what particular element is being born in the cold spaces. Temperatures of the sun and stars are thus readily determined, for many colors invisible to the naked eye can be detected and classified in the laboratory."

It is doubtful whether Cromwell had been listening to this technical discourse. Suddenly his body stiffened.

"GREAT SCOTT, Millstein! What is that great, white mass to the right? It looks like someone had poured a gob of sour milk in a bowl of thick chocolate and then stirred it violently."

Millstein did not reply for some time. Finally he spoke with a chuckle in his voice.

"That group of stars, Jack, is the great Nebula of Andromeda. It's barely visible from the earth, and considering our own planetary system, it's incomprehensibly prodigious in size. That Nebula is forty-five thousand light years in diameter and a million light years from the earth. Scientists believe that the nebulas of the sky, such as the Nebula of Andromeda and the great Whirlpool of Canis Venatici, are vast whirlpools or maelstroms of stars, planets, moons and suns of uncountable numbers. Perhaps some near celestial collision distorted them to the spiral shapes; but unlike a whirlpool, the stars are not moving toward the center. Observations of many years indicate that they are travelling out from the center, as the entire group revolves around its nucleus. Nebulas are one of the unsolved mysteries of the universe."

A phone buzzed at Millstein's elbow, and for a moment he listened intently; his eyes took on a keen glitter.

"Well, Jack, I guess your wish has come true. Lookout Number seven, in the port bow, states he has sighted an immense object about five hundred miles straight ahead on our course. Let's go back to the control room. Number seven says that the object is apparently a space ship because of its cylindrical shape, but that it's nearly a mile in length. That's just the sort of a craft the Falcon would have."

They repaired quickly to the complicated control room with its thousands of reflectoscopes, gauges and instruments, and seated themselves at their respective controls. This room was the heart of the

swift little space fighter. Millstein was always in direct communication with every part of the ship. Cromwell, always efficient, adjusted one of the reflectoscopes so that the area of the newly discovered space ship showed on the screen in front of him. He started back in surprise as the image of a mighty space vessel was reflected on the glass.

"I'll say it's a mile long, Chief. It must be the Falcon. Who ever heard of a ship so vast in proportions?"

Millstein did not hear, or at least he did not heed, for he was phoning to the radio room.

"Send a message to the strange ship. Give the customary salute. Ask their name and from what planet, and their destination. Make it plain that we are on government duty and mean business."

All the while the 'Nemesis' was slipping through space with incredible speed. Pressing a button, Millstein spoke into another receiver. This time he was connected with the power rooms of the ship. Here were located the apparatus that broke up atoms of mercury, transforming the energy of whirling electrons into enormous power. Converted electrons were discharged through the impellant tubes in the rear and nose of the fighter. The converted electrons roared out into space through the tubes with vast energy, forcing the space ship in any desired direction. At least they would have roared had there been any atmosphere to convey the vibrations of sound. But in space all is silence.

"Slow down the ship to barely cruising speed. Circle the stranger at five hundred miles distance. Radio the two government scouts of our discovery. Tell them to keep circling till further orders. Wait. Here's something, Cromwell."

With agile fingers Millstein arranged levers and his phone connection so that he was receiving direct a message coming from the ether. A taut but amused grin spread over his countenance. Cromwell stared with wondering eyes; he knew his chief was receiving some highly important news. Finally an impetuous nature could restrain itself no longer.

"WHAT is it, Chief? What are you getting?"

"Oh, nothing much," chuckled Millstein. "Just a friendly little message from the Falcon. The strange space ship is the 'Avenger,' so the Falcon calls it. He sighted us and is warning me to stay away."

"What does he say?" burst out Cromwell.

"Wait a minute," snapped Millstein. Then into the mouthpiece of the phone, "Turn on all protective rays full power. We may be subject to attack at any moment." Then turning to Cromwell, "The Falcon says about as follows: 'I've located you, Millstein, and your three ships. I'll give you just five minutes to leave this part of space, or I'll blast you out of existence. I've some new weapons to try out.'"

"Yes, and we've got some new weapons to try out also," broke in Cromwell, now ready for fight.

Just then the 'Nemesis' shuddered through its tough, steel frame. The air vibrated, and there was the faint odor of short-circuited electrical current.

"Treachery! Just as I thought!" snapped Millstein. "He is trying out some sort of a deadly ray on us. Didn't even give us the five minutes, but our protective screen rays are working fine."

"Look!" shouted Cromwell, pointing to the screen in front of them. "Look at the government scout ship."

Like a tragedy unfolded on a motion picture screen, a horrible catastrophe was disclosed to the two. The leading government space fighter that was next to the 'Nemesis' had suddenly exploded with fearful force. Its millions of frag-

ments were streaming in all directions through space. There the fragments would drift for millions of years, to become satellites to the planet earth.

"It's a fight to the death," snarled Millstein. "This time the Falcon will not escape. Think of all those poor devils in the government scout. Jack, radio the other scout to retreat a thousand miles. Their protective screens are not as strong as ours, and no doubt the Falcon has invented some new, deadly weapon."

"No use, Chief," muttered Cromwell, after a busy moment. "Our radio room says the other scout doesn't answer. Look!" Cromwell's finger pointed to the screen in front of them. "The other government ship is disabled. It's darting forward out of control!"

"YES," muttered Millstein anxiously, "by some devilish means, the Falcon has paralyzed or killed every human life on the fighter. Thank Heavens we have better types of protective screens on this craft."

"Yes, but our power rooms report that all dynamos and machines are being badly affected. Perhaps we'd better fly off a few thousand miles and reconnoiter." This was Cromwell's way of taunting Millstein to start the combat.

"Retreat!" grated Millstein. "I'll say we won't. Let's go. Here's where we fight to the finish!"

CHAPTER IV

The Battle of Space

BUT Millstein did flash away a thousand miles from the other ship, where he knew the vibrations and rays of the "Avenger's" weapons would be lessened in power; but it was not a retreat. Merely a strategic move to gain time for planning, and to study the enemy with powerful telescopes.

It is difficult to describe a battle of space ships. Such encounters are strangely unlike the dog-fights of airplanes, that circle each other, with vicious machine guns spewing out lead and death. Space ships in combat circle and dart about each other a thousand miles apart, testing the other's protective screens with destructive rays and rending vibrations. They circle and plunge about each other like boxers, trying to exhaust the power of the other's weapons. Strange weapons, those. Rays that burn and explode atoms. Vibrations that disintegrate metals. Rays of light, carrying sudden heat, that melt steels like butter.

Millstein realized he possessed the fastest ship and could thus maneuver more quickly. In his wisdom and experience he also knew his immense enemy had more power. In other words, more ergs of energy to hurl at him per minute in various forms. Millstein's position might be compared to that of a very skilled swordsman, armed with a light rapier, pitted against a herculean athlete, armed with a heavy cutlass.

Millstein and Cromwell were both in their element. Neither spoke. Every sense was concentrated on their great task—to annihilate the Falcon. Every nerve on edge, every cell of their brains alert. Messages were coming to them constantly from the various departments of the ship. Their eyes turned from gauges to instruments, and to the screens that were constantly and adroitly turned by Cromwell to reflect that portion of space occupied by the Falcon.

"Give them a shot from one of our rays," pleaded Cromwell.

"No, not yet. They're using lots of power now. Did you feel that? For a moment my senses fairly reeled. I wonder what strange weapon the Falcon is trying out on us. Look! It even affects the space compasses. See how they vibrate and oscillate." Then into one of the

phones connected to the power room, "Bill, throw on every atom of power you've got on all protective screens. We're being bombarded."

Then to Cromwell's supreme disgust Millstein ordered the ship into a maneuver that flung it away from the scene of conflict a full five hundred miles; at such a speed the acceleration was very painful.

"Say, what the——"

Cromwell's voice was cut off as he gasped for breath, for Millstein had stopped the ship so suddenly that deceleration almost pushed their bodies through the instrument table. Then quick orders, and the ship turned in space so abruptly that their bodies seemed flattened out. Millstein, the master pilot, the fighter of spaces, was at his best, for with full speed, and the maximum endurable rate of acceleration, the 'Nemesis' plunged toward the Falcon.

"Are we going to ram him?"

"No!" shot out Millstein, "but I'm going to show you some action. Get ready, Jack. We're going to give him a taste of my new ray Number one."

"Yes," muttered Cromwell in delight, fingering the controls of that deadly weapon. Already he had aligned the muzzle of the tube that projected the deadly rays that would reverse the direction of electricity in its energy flow in any metal that the ray encountered.

"Wait!" shouted Millstein, with one of his sudden inspirations that come to such geniuses in moments of stress and danger, "I believe, Jack, that he's tried that same weapon on us, so he must have built up a protective screen. Give him ray Number two, the disintegrator."

It was but the work of a second for Cromwell to align the tubes of the disintegration ray by use of the screen showing so clearly the position of the "Avenger." An observer seated in the control room of that marvelous space fighter would not have realized, except for the tense and slightly excited mood of the two men, that a terrific battle of incredible energies and super-wits was taking place, except, of course, from the distress of sudden acceleration and deceleration, caused by the diving and swooping of the craft, the sharp commands of Millstein into the various phones, and the lightning-like play of the pair's agile fingers like skilled operators at some vast switchboard.

Countless billion ergs of energy were expended by the two space fighters; destructive energies, conveyed on deadly rays, to be partly absorbed, dissipated or turned aside by protective vibration screens. The ancient Thor of mythological tradition, hurling his thunderbolts of lightning, would have gloried in such a conflict.

"GET ready," ordered Millstein. "When I say the word, bathe them with the ray."

They were flashing ten thousand miles an hour toward the "Avenger." Not much time had elapsed since Millstein had turned the ship for his daring attack, but their brains and fingers worked with incredible speed, and to the two highly trained men, the swift seconds were long. Millstein, carefully watching the gauges that indicated the strength of the rays and vibrations of the enemy's weapons, shrewdly waited until there was slight pause in the power registered on the instruments.

"Now, Jack, give it to them! We'll flash by within fifty miles!"

Cromwell carefully moved the sighting apparatus, keeping it aligned with the enemy ship. Comparatively simple, that pointing, it would have appeared to a casual observer, for the image of the enemy ship appeared on the smoked glass screen of the reflectoscope before Cromwell, and he had apparently but to point

an indicator, like tracing a line, to keep his ray guns aligned. But in spite of the apparent simplicity, there was an infinite skill and detail; a precise accuracy accomplished by Cromwell. He was the best ray-pointer of space. His keen, brown eyes held the light of some religious devotee, as his agile fingers moved indicator and levers.

"Good work, Cromwell. I believe you've hit them hard. The gauges showing the power of their weapons are registering nothing. Maybe we've disabled them. I don't know, though. We're up against the shrewdest brain all the universe. It may be a trick."

Again that strange, intuitive sense of warning came to Millstein, and in a sudden decision he turned the ship and shot away with a frightful velocity that tested even the skill of Cromwell to keep the ray tubes aligned on the other ship.

Then a most amazing, near-catastrophe occurred! On the screen before them appeared the government space ship that had dashed off into space, coming straight toward them! It was only by an insanely quick maneuver that Millstein avoided the berserk craft.

"Great Scott!" muttered Millstein, "did you see that, Cromwell? The government ship is running amuck. Radio officers says they don't reply to our signals. The ship is circling the heavens in weird, uncontrolled circles at full velocity. I've an idea. The Falcon has devised some sort of a devilish ray or vibration that has made the commander and men of the ship insane. Perhaps he has gained control of their minds by some hypnosis or mental projection, and caused the government commander to think we're his enemy. You know the Falcon is an adept in mental control. Watch carefully, Cromwell. The government space ship tried to ram us. We have two ships to fight now. We have——"

Millstein's voice trailed off as the air about them fairly crackled with some fierce energy. The gauges registered crazily, and some showed no reading whatever. With a great mental struggle Millstein roused himself and hastily slapped Cromwell smartly on either side of his face.

"Snap into it, Cromwell. We didn't hurt the Falcon much. He just gave us a sample of some new, horrible weapon. Do you know I believe he has tumbled on my idea of the vibration ray carried along a stream of light. I'm still tingling."

"I'M Okay now, Chief, but I feel as though a million hornets had stung me."

Millstein noted with great relief that the instruments were now registering normally, and again he turned the ship to swoop toward the Falcon. They had rocketed away from the enemy a full two thousand miles in the last maneuver.

For a few minutes he drove his attack at an angle.

"Keep a sharp lookout for the crazy government ship," telephoned Millstein to another part of the space ship. "Keep full power on all protective screens. Have the emergency crew inspect the entire ship and report back. Give me report on our energy-storage and let each man be prepared against unusual body stresses."

As they neared the 'Avenger' the 'Nemesis' began to shudder, the air to vibrate, and for a few moments Millstein studied the gauges carefully.

"Well, here's something, Cromwell, that will delight your heart. The energy rays of the "Avenger's" weapons are not registering so strongly. We are depleting even their vast power plants. Of course it may be a trick."

"Careful!" shouted Cromwell. "There comes the government scout again, approaching us from the rear, twenty-five degrees to the starboard."

Again it took all of the shrewd and trained flying instinct of Millstein to avoid the plunging government scout.

"There's no question about it. The Falcon has obtained mental control of the government scout. Our disintegration ray is a failure. Apparently the Falcon has some sort of a screen. Wait, here comes a message from Number ten power room. Great Scott, Cromwell! Engineer Kelly reports three of his men have suddenly gone crazy, and he has had to knock them out with a paralyzing ray pistol. Don't you see, Jack, the cursed fiend has devised some way to shoot a ray of energy that affects one's mentality. In some mysterious way the Falcon can project his evil mind and dominate that of a weaker one. Well, here goes."

With that Millstein became a fiend himself, a madman obsessed with the idea of removing this menace to civilization. The fast space ship dove and plunged and shot out deadly rays at its larger enemy. Many times it barely avoided the plunging rushes of the government scout. Millstein spoke no word. His fingers played over the instrument with incredible speed and certainty. All weapons were brought into play, and with incomprehensible skill the larger ship was bathed and bombarded with every kind of destructive ray, of vibration, heat and energy. It was plain that the enormous power of the "Avenger" was growing weaker. Finally, after hours of risky, daring evolutions and shrewd dodging of the whirling government scout ship, Millstein glanced at Cromwell. There was a strained expression on Millstein's face, the look of an athlete winning a marathon race, but not finished, for in the coal black eyes there was implacable determination. Don Millstein was not defeated.

"CROMWELL," his voice was almost mechanical in its coldness and tenseness, "we've just one more card to play. I'll dive close to the Falcon at full speed. As I come to within one hundred miles, I'll start to make a swooping orbit around his ship."

"One hundred miles!" exclaimed Cromwell. "That's too close, Chief. We——"

"We have only one shot left in our locker," interrupted Millstein. My three new weapons have failed, even the beam of rays, that slow up the electronic speed within atoms to produce absolute zero. I had counted on that weapon."

"Going to give them Number four, Chief? The shrill sound vibrations?"

"Yes," snarled Millstein. "That's the reason I want to go that close to make the force as strong as possible. I don't think the Falcon has thought of this weapon."

The daring evolution was safely executed, although the sturdy little craft trembled and vibrated with the power of destructive rays in which it was literally bathed by the 'Avenger' as it circled at full speed.

It was characteristic of Millstein when he looked up, after shooting away to a safer distance, although his last weapon had failed, that there was no discouragement on his lean face.

"Well, Jack, the Falcon had even thought of that. He has a protective screen against our sound vibrations, and it must be a good one."

Cromwell, brave as Theseus slaying the Minotaur, spoke without a tremor in his voice.

"Chief, let's ram them."

For a moment Millstein sat silent, considering mightily.

"No, Jack. That won't do. I've an idea. You know in my past encounters with the Falcon, I have discovered his one weak point. I mean his egotistical pride. He is vain and boastful of his physical valour. He is a mighty man in strength and thinks that he can outdo any

other human with primitive weapons. I believe I can trap him."

"What are you going to do?" asked Cromwell in an awed voice.

"I'm going to challenge him to a duel. Here, radio this message. 'To the Falcon. I, Donald Millstein, challenge you to a duel with swords. My ship is unharmed. If you do not accept, I am going to ram you. Thus both of us and all our men will perish. I dare you to don your space suit and meet me. Bring no weapon but propulsion pistols and one sabre. I will bring my ship to within five miles of yours. We will each leave our ships and fight it out in space. May the best man win. (Signed) Your sworn enemy, Millstein.'"

Cromwell choked a bit, but his voice rang strong and steady as he sent the message. In a few moments came the reply, short and tense.

"Terms accepted. Get ready, my enemy. I am coming gladly. (Signed) The Falcon."

CHAPTER V

A Strange Duel

"I KNEW that ruse would work," exulted Millstein. "The Falcon is very proud of his skill with the swords. In Russia he gained quite a reputation as a duelist. It is said that a dozen men died before his deadly blades. That challenge to his pride is his weak point."

While Millstein was talking, he was being assisted into the heavy and bulky space suit. The heavy suit, made of pressure resisting material, encased his body like a huge diving outfit. The material was of sufficient tensile strength to prevent the vacuum of space from expanding his body. Also it was air tight that the precious oxygen stored in small cylinders inside the space suit could not escape, except that portion used by Millstein, and allowed to escape through the release valve. In fact the space suit was strangely similar to the cumbersome armor used by deep sea divers. The metal part of the suit was made of an extremely light but very tough metal. Its composition was similar to the aluminum alloys of many years past. The inside of the suit was lined with gold-beaters skin. Very strange that these scientists of a super age would go to nature for such a material, but the gold beaters skin was found to be an excellent material to control leakage. It is the outer membrane of the large intestine of the ox.

The suit was provided with small atomic energizers to produce heat, for in the absolute zero of space the occupant of a space suit would freeze in an instant unless artificially warmed.

It was with great difficulty that Millstein, in spite of his extraordinary strength, moved about when he had donned the suit. Just before screwing on the helmet, Cromwell made another earnest plea.

"Let me go in your place, Chief. You're too important to lose your life in this fool stunt. The Falcon won't know the difference. The space suit will disguise me. Let me go out and cross swords with the devil. Anyway, I think he will send a substitute. He's too smart to risk his neck."

"No, Jack. This is my affair. I believe I can overcome the Falcon. Your duty is here at the ship, and don't you worry about the Falcon coming himself. My hunch about his sensitive pride is a good one."

With that Millstein clumped forward into a round airlock in the side of the ship. With a resigned sigh, Cromwell placed in Millstein's awkward-looking hand, that was clumsily gloved with strangely flexible metals, a heavy old-fashioned army cutlass.

"CHIEF, I've sharpened that meat knife till it's like a razor. Don't get too close to the Falcon. Try and pierce his suit and let his oxygen out. Goodbye, Chief. Good luck!"

"Wait a minute," laughed Millstein, "you act like I'm going out to meet his satanic majesty. I'm coming back. But —but—Jack, if I don't come back, do the best you can with the ship. You'll be in full command in case anything happens to me. And don't forget this. If the Falcon should overpower me, and if because of any treachery on the part of the enemy ship I should be captured, you know what to do. You know that trick we talked over, the emergency ruse. Screw the helmet on."

Millstein pushed forward to the end of the steel lock that was like an iron coffin. There he adjusted his oxygen valves and tested the heat generators. Perspiration instantly streamed from his body, and he turned the apparatus off, realizing it was operating efficiently. He could not speak now, for the helmet was tight over his head, but through its clear quartz lens he winked insultingly at the anxious Cromwell. With a nod of his head, Millstein signalled for the inner lock-door to be closed. Cromwell turned the lever, and a serrated door of the toughest steel, two feet thick, slowly closed in front of Cromwell, leaving a perfectly smooth wall.

Cromwell yearned with all the fiery ardor of his adventurous young heart and an adoring love for his chief to be in the struggle to come. His duty was to remain as instructed, and with grim determination depicted upon his countenance, he pushed another lever. This he knew opened the outer steel door of the lock, and Millstein was free to push out into the vast void of endless space.

Millstein, wise to the uncanny conditions of space, gave a slight push against the wall of the airlock and almost instantly was several hundred feet from the 'Nemesis.' It was a strange sensation floating out in that vast void, while the "Nemesis" and the "Avenger" were "standing still." In reality the whole mass, in fact all the universe is moving in one direction at a vast rate of speed. But as each object in space retains its relative position unless given inertia, it appeared to Millstein that the two ships and himself were motionless. He slowly raised his right arm that held the sabre. The structure of the material that covered and protected that strong arm was extremely heavy, and Millstein moved like a figure on a slow motion picture screen.

For a moment or two he practised wielding the sword, for he knew his life depended upon his skill and quickness with that weapon. The movement of raising his arm caused his body to turn over out of balance, so that his face was away from the enemy ship. That would not do. Swinging the sword violently in the opposite direction, he succeeded in turning his grotesque looking body. In space an object will move forever at the rate of its initial inertia. This is because of the complete vacuum, no air and no resistance. In space acceleration and its rate are affected only by the mass of the body to be accelerated. This effect is due to what is termed inertia. Etymologically speaking, inertia can be termed the "laziness of matter," for in human life laziness is sometimes the deadest kind of resistance.

NOW that Millstein was out of the space ship, he had to be extremely careful not to accelerate any movement too quickly. Tests on earth had shown that humans could attain a speed of two hundred and fifty miles an hour in one second of acceleration without injury, providing the person was in perfect physical condition. The principal danger that

confronted Millstein in his coming duel with the Falcon was the risk of sudden turning while travelling at high speed. This would generate centrifugal force, an effect similar to that of acceleration, and which has a tendency to drive the blood violently from one side to the other, and risking the rupture of blood vessels. But the learned and skilled scientist was aware of all these hazards.

Once more he checked off the condition of his oxygen valves and heat units and found them to be operating perfectly. Then he looked carefully toward the cigar-like shape of the mighty "Avenger." After a few moments his eyes made out a tiny figure floating between himself and the enemy ship.

"The Falcon!"

With his left hand Millstein pulled one of the propulsion pistols from his belt and fired it in a direction exactly opposite from that portion of space occupied by the Falcon. Instantly Millstein's body shot forward, and for a moment his breath came painfully. Clumsily, like a man trying to pick up a thin dime with boxing gloves, he adjusted the energy charge of the pistol by means of a large-handled screw on the side of the pistol.

"Charges are too strong," he muttered.

The propulsion pistols were not weapons of offense or defense. They were simply the means of propulsion in space. By firing the pistol, which discharged a very small burst of atomic energy rays, its recoil pushed Millstein in the desired direction. Inasmuch as he would move forever at the rate of his initial inertia, it was necessary to stop by firing a charge in the opposite direction.

Again he looked toward the "Avenger" and noted that the other human figure, if it could be termed a human figure, was now very much closer. This was to be the supreme test of Millstein's flashing career. He realized full well the desperate odds against the success of this encounter. He was keenly aware of the mental powers and resources of his clever antagonist.

Glancing about in four dimensions and searching the void carefully, he could see no trace of the government scout ship, that had been plunging dizzily about in the sky.

"That's positive proof," muttered Millstein, "that the government scout-ship Commander's brain is under the control of the Falcon."

Glancing again toward the rapidly approaching figure of his opponent, Millstein could see the other was advancing warily, circling as if to study his foe and plan a proper attack. Then a very clever thought came to the young scientist. For a few moments he closed his eyes and concentrated his mind on the task before him, summoning to his immediate control all his mental faculties and physical energies. He made his mind a complete negative as far as all other problems were concerned. For the moment he forgot his own space ship, the 'Nemesis,' Cromwell and the brave men he had left behind. In moments of great emergencies Millstein always followed this rule, for he knew his enemy, vast and far-reaching though his intellect was, would have an incredible amount of detail on his mind.

It was well that Millstein suddenly opened his eyes after his mental concentration, for scuttling toward him at terrific velocity came the huge, crab-like figure of the Falcon. Shrewdly and tensely Millstein awaited the bull-like charge. Then at the last split second, propelled by a heavy charge from his propulsion pistol, he barely eluded the fearless rush of the other.

"That was close!" muttered Millstein.

Like two grotesque crustaceans, weighed down with the vast pressure of a mighty but transparent water, the two fighters maneuvered. Their attacks and dodges were surprisingly quick, yet their

arms moved with painful slowness—moved like Sisyphus toiling up the eternal mountain. Time after time the Falcon charged, but always Millstein dodged like a very clever bull fighter, who slips aside when it seems he will be impaled upon the horns of a furious bull.

Millstein was employing a very clever plan of attack. He was saving his strength. The effort of moving heavily protected arms and legs took a tremendous lot of energy in the mysterious realm of nothing. Millstein wisely figured that the Falcon was using up his propulsion pistol charges very rapidly. It was a soundless battle. If either spoke or cursed, the sounds only thundered in their own ears.

Suddenly as the Falcon was circling for another charge, Millstein keeping his propulsion pistol well concealed, fired a sudden blast, and was hurtled directly toward the Falcon. It was a propitious moment for Millstein's attack, as the Falcon's body was turned in air so that he could not present his sword in defense. For a moment it looked as though they would collide, and the Falcon be pierced through and through, for Millstein held his heavy blade directly in front of him. He did not try to wield or swing it, for it might have turned his body, and he might then be placed in a position where he could not defend himself. It was a bitter moment for Millstein, who had waited long and patiently through the weird struggle for this moment. The Falcon could not raise his pistol in time to fire and dodge away, but he succeeded in meeting the attack, and with a movement that must have taken incredible strength, swung up his sword and parried the thrust of Millstein's sword.

Up to this time the movements of the combat had been comparatively slow, but now they seemed to move about like two infuriated monsters of the deep ocean. As Millstein plunged by his enemy in a sudden charge, he immediately twisted to protect his rear. To his consternation the Falcon was directly behind him and forcing his acceleration at a dangerous rate. It was then that Millstein displayed the peak of his fighting skill and bravery.

Shrewdly noting his position, he fired several atomic blasts against the direction of his travel, holding the pistol to one side that his body might be turned to meet his foe. He was infuriated. It was to be a battle to the death. Humanity would be well served if Millstein could die and wipe out the dangerous Falcon.

THEY were together! Millstein found his chance, and risking all, he released his hold on his propulsion pistol, and with his strong left hand grasped the left shoulder of the other. They were too close now to use their swords, and as they slowly turned, clutched together, the evil eyes of the Falcon glared through his quartz lenses into Millstein's eyes.

Millstein suddenly felt a great pulling at his right shoulder and saw that the Falcon had also released his propulsion pistol and grasped him with his clumsy hand. Millstein knew he must act quickly, for he could feel the fearful strength of the other trying to twist his arm and tear his space suit. Like a man in a dream, he watched the sword arm of the Falcon creep upward and raise the sword point. The clever Russian was maneuvering his shorter weapon that he might pierce Millstein's space suit.

Millstein suddenly felt as though a deadly gas had entered his brain—that he did not care what happened. Stubbornly he fought against this sluggishness, for he knew that the Russian was trying to use a hypnotic or mental influence. After a moment's concentration, while he watched the point of the sword slowly move upward, a great mental and physical strength came to Millstein; he knew that he was the other's master.

Concentrating all his muscular effort and energy into one mighty effort, he struck violently with the hilt of his sword at the wrist of the Falcon. It was a desperate blow, and while the movement seemed to travel with infinite slowness, yet the heavy heel of the cutlass struck the Russian's arm with stunning force long before the point of the deadly sword crept upward to Millstein's body. With a great exultation Millstein saw the heavy cutlass of the Falcon drift away from a grasping hand, and soon the sharp weapon was many feet away from them.

Millstein had conquered the Falcon, but he must be careful, infinitely careful, for he knew full well the vast resources and treachery of the distorted mind. As quickly as possible and still holding his mental concentration, Millstein raised the point of his cutlass and inserted its sharp point under the shoulder plate of the other's space suit. The Falcon glared with malicious hatred into Millstein's eyes. The Falcon was defeated, for with a powerful, cutting thrust, Millstein's sword could be slipped through the armor's joint and allow the oxygen in the Falcon's space suit to escape.

BUT the evil powers of the Falcon were not expended. Still grinning with a horrible hate, he raised his right hand sluggishly above his head. It was some sort of a signal! A terrific tingling broke out over Millstein's body. His mind became numbed. His muscles would not function.

Treachery! They were sending out a powerful, paralyzing ray from the "Avenger" upon seeing that the Falcon had been defeated.

Millstein made a desperate mental struggle against this terror. It seemed that he was slipping into a dark abyss of oblivion—slipping with clutching fingers that would not hold at an icy, slippery precipice. Thanatos—the god of Death—brother of sleep—was clutching for him.

Just as Millstein's mind slipped into unconsciousness, he saw a tiny space fighter shoot from the "Avenger's" stern, and he realized with a last hopeless consciousness that, through treachery, he had been defeated by the Falcon.

CHAPTER VI

The Falcon Gloats

DON MILLSTEIN struggled painfully back to the realm of consciousness. The uncanny instinct that had carried him safely through many incredible perils, functioned even before his brain had cleared away the deadly fog.

Slowly memory returned to him. The weird battle of swords in space—how he had overpowered the Falcon; a realization of the trickery and treachery used to overcome him. He was lying on some soft substance, probably a couch, and now knew he was a captive on board the "Avenger." Millstein kept his eyes closed, while his still reeling brain recovered normality.

He decided he would pretend he was unconscious, until his strength had fully returned. He could plainly feel that the space suit had been removed from his body. He wondered if he was bound, but did not dare to move as a test.

He heard a voice close by; the cruel, harsh voice of the Falcon!

"Millstein will recover in a few moments. The paralyzing rays must have hit him severely. I could feel them in spite of the protective screen I had."

Millstein yearned to spring to his feet and strike the Falcon down as he heard the foul treachery disclosed in a cool, hard voice. He lay quiet, his agile brain scheming—planning—every sense alert. The harsh voice of the Falcon again grated loudly giving technical instructions to some member of his crew.

"And see that the lenses that convert the cosmic rays are adjusted that the changed rays strike the earth from latitude forty to sixty as the cursed planet revolves."

There was an insane chuckle in the Falcon's voice as he continued.

"That path will play the changed rays over London, Germany, Russia, Salt Lake City, Chicago, New York and Boston. If only Millstein had not discovered what I am doing. Another six months, and the world will be mine; a dead, lifeless globe. Then after all life has ceased, I will restore the oxygen strata. Then, my children, we will take earth. I will be the supreme ruler. I will start a new civilization."

Millstein controlled himself with great difficulty, but succeeded, when the important information he was seeking came from the lips of the Falcon. Millstein's nerves tensed for an ordeal when he heard the Falcon drawing closer. Finally he could feel the Russian's hot breath on his cheek, as a rough finger pulled his eyelid down for examination. A shrewd, calculating look crept into the Russian's face as he placed two fingers upon Millstein's wrist. Millstein made a strong mental effort to control his heart action, but he knew his pulse had accelerated and that his simulation of unconsciousness was discovered.

"Ah, so!" exulted the Falcon. "The great Millstein, the world's hero, feigns unconsciousness like a cowardly 'possum. Come, my enemy. I want a little talk with you!"

REALIZING that his subterfuge was discovered, Millstein rose to a sitting posture on the couch. Deliberately and coolly he executed a great, gaping yawn, like a man awakened from a long and hearty sleep. He was dealing with an insane man and decided he would humor him in every possible way.

Millstein felt that although the Falcon was cruel and remorseless, his own life was safe; at least for the time being. He reasoned Cromwell would not attack with the 'Nemesis' for fear of injurying him.

Simulating a vast nonchalance, Millstein sat back comfortably on the couch and looked squarely and fearlessly into the blazing eyes of his enemy. He could feel the hypnotic influence of those bright, evil orbs, but confident in the strength of his own powers he gazed unflinchingly. After a moment the Falcon spoke in a sneering tone.

"The great Millstein is brave, but before I am finished you will wish you could die."

Millstein planned to again attack the weak spot in the Falcon's armor—his egotism.

"Fine ship you have, Verensky," from Millstein appraisingly, as he glanced coolly about the well arranged little room. He tried a daring thrust.

"I suppose your ship has some apparatus that's changing the cosmic ray vibrations before they reach earth."

It required all of Millstein's courage and fortitude to remain unflinching as the Falcon sprang forward, drawing from his belt a deadly ray gun. On the Russian's face was a demoniacal expression. His eyes blazed hate and anger, and for a moment he lost his composure and caution.

"So!" he snarled, "you think you have discovered what I am doing? Well, you will never profit by it. You can't stop me. I will not be stopped! I have you in my power. I have a fate in store for you more terrible than even your clever imagination can picture. I am going to rule the world!" The Falcon's voice rose to a berserk scream.

"AFTER I have conquered the world. I will conquer the other planets. Come with me! I will show you the de-

vice that changes the cosmic rays. There's no risk in showing you. You will live, but I will rule your brain!"

Millstein rose to his feet, scarcely able to restrain his eagerness. He had taunted the Falcon into a reckless anger, and apparently he was going to see the device. His mind raced. Perhaps he could destroy the device that changed the cosmic rays. First, however, he must see how it was constructed. Cleverly he fanned the flame of the Russian's anger.

"Verensky, I think you are bluffing. My reference to the cosmic rays was but a ruse. As far as my personal safety is concerned, do what you like. I would not expect you to play fair after our space battle with swords. By the way, Verensky, I have heard you're very clever with the blades. Why not give me the satisfaction of crossing swords with you right now in this room?"

With a crafty look on his face, the Russian's sudden rage in a great measure dissipated, and his usual cunning returned.

"You are indeed clever, my enemy. Oh, no! I will not fight a duel with you. I have other plans. You are going to be one of my lieutenants."

"What!" exclaimed Millstein. "I work with you—the most dangerous criminal in all the universe? It's a war to the death, Verensky, and while you have me in your power, I would advise you to kill me."

Millstein was cleverly trying to lead out from the Falcon some idea as to his fate.

"But I am not going to kill you," laughed the Falcon in derision. "I am going to obtain control of your mind and take from your brain all its information, just as I would squeeze a sponge."

Millstein could see the anger rising in the crazed criminal.

"You can't get control of my mind by hypnosis or any other method," stated Millstein in an insulting tone. "My willpower is stronger than yours."

The Russian trembled with rage, but in a short second gained control of his emotions, and Millstein's blood ran cold at the deadly tone in his enemy's voice.

"Yes, of course, Millstein. Your brain is strong. Your will is mighty. That's the reason I want them." Insane chuckles came from the corded throat of the giant Russian. "Don't you see, my fine, heroic altruist—you who pose as the savior of the world—you who bask in the warm light of the public favor. Don't you see, fool? I want your brain because it is a fine brain. In your present condition you could resist my hypnotic influence for some time, but I have methods of my own. These men standing back of you with drawn weapons are under my influence. See the dull, meaningless stare in their eyes, their hopeless expressions. I own their souls! I do their thinking. I am their brains. They are mine!"

With that the Russian beat his breast with mighty blows.

"I am the Falcon!"

MILLSTEIN turned and looked intently at three tall, strong men who stood directly at his back with drawn ray guns. They were like mechanical men, yet depicted upon their countenances was a tense watchfulness. Millstein knew the slightest movement on his part to attack the Falcon would mean his instant death. He turned again to the Russian, who was continuing his wild oration. Millstein was gaining valuable information and continued to taunt the Russian in the hope he might see the apparatus affecting the cosmic rays.

"Well, why don't you go ahead and try to hypnotize me?" goaded Millstein.

The Falcon studied Millstein intently for some moments, then he came closer, wringing his hands like a miser counting gold pieces.

"Not yet, my enemy, not yet. There is a way to weaken your resistance. You will go without food for many days. When the body weakens, eventually the will-power weakens. Then, too, you shall have a very special treatment. You shall have heshi, the drug that I discovered on Venus. A nice big dose twice a day, and after a week you will not have will-power enough to claim your own soul. It will be mine."

It spoke well for Millstein's courage that he showed not the slightest fear at the mention of heshi. He knew of that fiendish drug that weakened men's resistance, stupefying the brain and causing them to be subservient to a stronger will. The Falcon had no suspicion of the tumult in Millstein's breast as the young scientist laughed.

"I should not think the great Falcon would have to resort to a drug to best his enemies. Where is your boasted power? I am amused." Then Millstein tried a bolder play. "I do not believe you have any machine or device to affect the cosmic rays."

"All right!" snarled the Russian. "You shall see, and then you will be confined and start your education as a drug addict."

The Falcon gave instruction to the three guards in some strange language, and the mechanical men instantly formed behind Millstein. The group progressed through a long corridor and passed many rooms filled with whirling machinery and active operators.

Millstein was impressed with the magnitude of the ship. He yearned to ask the Falcon where the ship had been built. It must have taken years to construct such a craft. Trained though he was in the operation and mechanical features of space ships, yet there were many devices and machines unfamiliar to Millstein.

Finally, turning through a side corridor, they came to a balcony that overlooked a room of circular shape, some five hundred feet in diameter. In this room were hundreds of intricate machines—dynamos, condensers and various kinds of complex electrical devices. The Falcon stared into that vast, circular room filled with whirling machinery with the look of a religious devotee worshipping an idol. His thin, cruel lips drooled an insane prayer of hate and vengeance, as though the Devil were praying. With his vicious eyes bulging from their sockets, he glared at Millstein.

"There it is, my enemy. For years I have worked. Look at my marvelous machines whirling—breaking up atoms——changing vibrations!"

Millstein did not reply. His keen mind strove to analyze the devilish machines in the mighty room. He noted one incredibly large dynamo with a giant flywheel revolving at terrific speed. This dynamo was connected to a long series of machines that appeared to be huge transformers. The air in the center of the room was filled with blue and violet rays. These color rays seemed to form like a large cloud that weaved and contorted about the room, twisting and whirling in a mighty whirlpool of energy. It would expand and assume grotesque shapes, usually rounded like some protoplasm. Millstein knew he could not analyze the apparatus without a close and lengthy examination, and he felt sure that the Falcon would give him no technical information. He regretted that he had not concealed some high-powered explosive to hurl among the machines.

"NICE little workshop," he commented, "but those machines can't affect the cosmic rays. It's ridiculous!"

For a moment the Russian swelled with red rage, then his caution gained the upper hand.

"I must be careful. You are clever, but I will not tell you how it's done.

I won't! I won't!" His voice rose to a scream. "I'll tell you this much. This apparatus is built in the center of my space ship. This room is five hundred feet across. It changes the cosmic rays as they flash toward earth. The great lenses at the top of the ship focus them to the center, where the interesting little ball of color rays gives them my secret treatment. Then the changed rays are refracted and transmitted through the lenses in the bottom of the ship. The converted rays go on to earth, where they do queer tricks with oxygen electrons. I have been unable to change the cosmic rays to affect other elements as they do oxygen. But I am working on that, and you are going to help me. You have a fine mind. When I've gained control of it, you are going to be my assistant. You have a lot of knowledge I can use. Come now, Millstein. You are going to be locked in a cell and the only food you will get is the pleasant drug."

"There is just one thing you have overlooked," shot out Millstein defiantly. "I left instruction with my space ship to attack in two hours if anything happened to me."

"Is that so?" sneered the Russian, "and you prate about treachery." He laughed long and loudly. "In two hours, you said, my enemy. You don't know how long you were under the effects of the paralyzing ray. Listen! You have been on board the 'Avenger' for twelve hours!"

Millstein made no reply, but in his dark, brave eyes crept a more determined expression.

CHAPTER VII

A Mental Duel

THE Falcon led the way back along the corridor until Millstein knew they must be close to the stern of the mighty 'Avenger.' Millstein was desperate, and he hastened his steps closer to the rapidly striding Verensky. It seemed, however, that the Falcon could see through the back of his head, for without turning and grunting out a horrible chuckle, he gave quick orders to the bodyguard directly behind Millstein. The guard moved up closer, and two rapidly stepped in front of Millstein so that he was practically surrounded. As they walked along Millstein looked intently into each room. He was fixing in his mind the plan of the ship.

The resourceful young scientist had often been in desperate situations, but none so hopeless as the present. In each room or compartment he could see robot men working on intricate machinery. The 'Avenger' was without question a mighty space fighter equipped with every possible means of offense and defense.

An officer who appeared to be of a higher mental type than the others came out from one of the side corridors and spoke respectfully to the Falcon. On the officer's face was the same vacant, set expression, but his features were more finely chiselled, and it was plain he possessed more initiative than the others. Still the resigned, hopeless expression in the dull eyes showed the mind belonged to the Falcon.

"Great Cosmos!" muttered Millstein, "the Falcon has all his officers and crew under mental domination. He takes no chance of treachery or disobedience."

Then he dared a few more rapid steps that he might hear what the officer was conveying to the Falcon. Whatever the message was Millstein never knew, for the conversation was in a strange tongue; but whatever it was the Falcon was greatly pleased, for he turned to chuckle gloatingly at his prisoner.

"Here's some news for you, my enemy. My radio officer reports that for some hours there has been no message coming from your ship. Just for your informa-

tion I'll say we have been turning a new, deadly ray on your ship. It is one of my new weapons, and I know that your ship has no protective screens for this ray." The crazed Russian beat his breast like an infuriated gorilla. "No one but the Falcon would have thought of it. It took me two years to perfect it. I have produced a high sound-vibration that travels along a beam of light and instantly paralyzes every human within the radius of its active range. Your men will be unconscious and disabled for many hours. The weaker ones will die. Some brains disintegrate from the terrific vibrations. I killed a hundred men before I perfected it. But what is a man's life compared to the plans of the Falcon? I, who will rule the world and all the planets."

COURAGEOUS and quick-witted though he was, Millstein nearly betrayed his sudden exultation. There was now a desperate hope; a fighting chance! He knew the Falcon had discovered the sound vibration ray, the same he had himself perfected. His heart bounded with a wild hope. He knew Cromwell was playing the trick—the daring ruse they had used before in seemingly hopeless situations!

"Of course," Millstein reasoned, "the Falcon, having discovered the sound vibration ray, has no doubt built up a protective screen for the same ray if used against his 'Avenger.' That's the reason my weapon did not affect the 'Avenger.'"

A most disturbing thought came into his mind. Perhaps Cromwell had forgotten to turn on the defensive screens to neutralize rays and vibrations. Perhaps his gallant lieutenant had been lured into a sense of false security during the battle of swords in space. Millstein instantly put the thought aside as unworthy; Cromwell had never failed him in any detail. He suddenly felt confident that his young lieutenant was trying the ruse they had used before—an incredibly simple, yet strangely effective strategy.

The Falcon's cruel heart was gladdened to note Millstein's look of dejection because of the startling information about the paralyzing ray. A most clever bit of acting. To the Falcon it seemed Millstein was making an effort to appear nonchalant—not to show he was greatly perturbed.

"Ah ha!" croaked the Falcon. "That gets under your skin. I warned you not to interfere with my plans. Now you are my prisoner with a horrible fate in the future for you. Your fine space fighter is disabled; your men paralyzed. I have destroyed one of the government scout ships. I have gained control of the commander's brains in the other. Now do you know what I am going to do? I am going to order the commander in the government space ship to dash his craft into the 'Nemesis.'"

A sudden partial sanity returned to the Falcon.

"No! No!" he screamed, his lips working crazily. "That would not do. That is foolish—is it not, Millstein? I can use both those ships in my warfare against earth. I shall take them back to——"

Millstein had been listening intently—eagerly—for he had gained important information from the rambling Russian. He had admitted the government space ship was under his mental control and had nearly told Millstein where his vast workshop was located. Millstein now knew the Falcon's mighty factories were on some dead or unknown planet far beyond the solar planetary system—some uncanny place in the endless realms of silent space, where the fantastical plans of a distorted mind were developed. Again a surge of confidence swept over Millstein like an engulfing wave, to give him a mighty confidence in his own powers. By some uncanny instinct he knew he was the mental master of the Falcon, that

his wits were keener, his will more powerful. He tried another rare strategy.

"But no one knows how to operate the 'Nemesis' but myself. Its controls are known only to myself and to my brave lieutenant, Cromwell, who is now paralyzed."

With that Millstein managed to look very sad and hopeless as he continued.

"You will never use the 'Nemesis,' Verensky, for built within its compartments are explosives, and any attempt to operate it by one not knowing the concealed secret devices would blast it into eternity."

"I THINK you lie!" snarled the Falcon.

"Oh, very well. Think as you like," taunted Millstein, "but you will never use the 'Nemesis.' Why don't you go over and try to operate the ship?"

This last bolt struck a responsive cord in the Russian's twisted mentality.

"That is just what we will do, Millstein. You and I, and of course a group of my trained men, will board the 'Nemesis.' There I will drug you and keep you prisoner until your weakened mind gives me the secret of the controls."

Millstein could have shouted for joy. The trick had worked! If he could only get aboard the 'Nemesis.'

"I'll never do it!" he screamed. "You can't make me do it. It's horrible to think of your using my 'Nemesis' against the world!"

Then Millstein used his cleverest sophistry—played a seemingly poltroonly part to gain his point.

"Verensky," he began, in a voice pleading and almost servile, "you are the greatest mind in the universe. You possess the most marvelous fund of scientific learning. I beg of you to give up this wild idea of conquering the world. You could be great with your mighty power and intellect. You could be a benefactor to mankind with your skill and resources. Why, you could change the rotations of the earth at will and make climates to fit man's need. You could put life into the dead planets; cool off those too hot for habitation; warm those that are too cold. There is no limit to the good you could accomplish. Why, you could be next to the Master Mind. There are none so powerful as you. If you will give up your mad idea of universal destruction, I, Donald Millstein, will work at your side. Together we will do all these things. I ask this of you in the name of humanity."

For a moment during the impassioned appeal of Millstein, a strange, uncanny light glowed in the face of the mad Russian. Calm reason seemed to be struggling to shine in the glittering eyes, and for a brief second Millstein fancied that he had gained a point. But suddenly with the wild scream of a madman, the Russian beat on his breast till it sounded like a drum. Incoherent words puled from his twitching lips.

"Now you will die a thousand deaths, my enemy! How dare you ask me, the Falcon, the sworn enemy of the world, to be an altruist. Altruism! Bah! Say no more, or I will turn a ray gun on you."

The Russian was trembling in a fit of uncontrolled anger, as he turned to the waiting officer.

"GET ready a squad of fifty of my best engineers. We are going to board the 'Nemesis.' I will wring from Millstein the secrets of his ship. We will keep him captive, and I will torture him with my bare hands and drug him until I am his master."

Millstein put his head in his hands and bowed as though broken. He could scarcely control his emotions. He realized joyously that he had tricked the madman.

They were going to board the 'Nemesis!'

CHAPTER VIII

On Board the "Nemesis"

THE Falcon, accompanied by a greatly increased number of officers, moved with Millstein to the extreme stern of the great ship. Millstein appeared a broken man as he walked along, but his shrewd, trained mind was noting every detail and analyzing every opportunity. He observed keenly the movements of every man, keeping a careful observation of the Falcon's movements.

They finally entered a large tube at the end of the ship, a tube about thirty feet in diameter. In this long tube reposed a small space ship. As Millstein was being pushed into this tiny projectile, he noted the Falcon had suddenly disappeared. This was a cause of worry to Millstein, for he wished with a mighty hope that the Falcon would accompany the group on the trip to his own ship. Minutes passed, and the crew were each at their particular post ready to launch the little carrier ship. Millstein noted that each man was heavily armed with ray guns and equipped with some sort of protective armor; a strange, metallic fabric that glowed with the light of dancing colors. Millstein reasoned the suits were resistive screens against ray guns of all sorts.

To his great relief the tall figure of the Falcon suddenly entered the little craft and took a place at the main controls. Millstein, standing only a few feet from the Falcon, studied his enemy with infinite care. The Russian returned his searching scrutiny with a baleful glance.

For some reason the madman appeared to be a bit thinner in spite of the fact he also wore the strange metal garment that glowed with some strong and static energy. At the moment Millstein did not consider this of unusual importance, and he put the thought out of his mind. The steel door of the space projectile was closed. Verensky uttered sharp, gutteral commands in that weird tongue, and Millstein knew they were floating in space. Soon he felt the slight grating contact against his own ship. He knew they had entered one of its carrier tubes. His heart thrilled, and the strong muscles of his body tensed for action. He bent his head and concentrated all his mental capacities on the coming test.

He was rudely pushed through the open door of the little space carrier into the launching and boarding tube of his own ship. The Falcon craftily took a place at the rear of the group.

"Open the inside door, Millstein," ordered the Falcon, in hard, dangerous tones.

Millstein stepped forward. None but he in the group knew how to operate the strong steel doors that would admit them directly into the 'Nemesis.' The cleverly constructed doors of incredibly tough steel slid silently back. Millstein in the lead of the entire group stepped directly into one of the power rooms of the 'Nemesis'. He glanced about and a cleverly faked moan escaped his tense lips.

Slumped over at the seats of their operating chairs and lying in grotesque heaps on the floor were his fine, trained assistants. Then Millstein acted the part of a madman, and he turned like an infuriated tiger to glare at the Falcon.

"My good men; You have killed them! You crazy fiend! You murderer of worlds!"

The Falcon laughed throatily, and his words gurgled with joy.

"No, they are not all dead, my enemy. Some of the strongest will no doubt live. A clever weapon, my new paralyzing sound vibration. Perhaps I'll try it out

on you in a mild way to help weaken your will."

Knowing that it pleased the mad Falcon, Millstein continued to sob loudly, as he bent over the men lying sprawled upon the floor. Suddenly he stopped at one limp figure, with sprawled arms hanging down over a radio table.

"And you have killed Jack Cromwell, my best assistant!" Millstein frothed, leaping wildly towards the Falcon.

Several of the guards clutched Millstein and seemingly subdued him. Like an actor enjoying a dramatic moment on the stage, the Falcon strode about.

"SHACKLE Millstein," he ordered. "Fasten him securely. I will administer drugs and torture him to learn the secrets of the ship."

"Wait a minute!" shouted Millstein in the voice of Stentor. He had decided to play his trump card—he would spring the trick!

The Falcon looked up intently, a queer expression spreading over his face as he suddenly sensed danger—a trap.

With a panther-like spring Millstein suddenly leaped from the grasping hands of his captors and uttered a loud shout.

"For Earth!"

A most amazing thing occurred. Millstein's men, who had seemingly been unconscious or dead, suddenly leaped to their feet as if actuated by one spring! Each brave and trained assistant held in his hand a deadly ray gun. Like a swiftly moving and intricate mechanism, each man jumped to an invader and covered him with the ray pistols they had held under their bodies as they lay about the room. The invaders, who possessed no wills of their own, were no match for Millstein's men, even had the numbers been equal.

Jack Cromwell had leaped to a position directly in front of his beloved chief. Millstein threw an affectionate arm over his assistant's shoulder. "Good old Jack," he muttered happily. "Our trick worked beautifully."

"It sure did, Chief. When they turned the paralyzing ray on us, we fortunately had our protective screens working. I did what you told me just before you left. We adjusted the ship to be neutral and dead, and the Falcon thought we were paralyzed."

"Just an old western gun fighter's trick," grinned Millstein happily.

"Great Scott!" shot out Cromwell. "Look at the Falcon!"

Millstein, however, before looking at his defeated enemy glanced carefully about the room to note that each of the enemy was safely subdued. Then he directed his attention toward the Falcon.

The mad Russian had dropped to his knees, his face uplifted. There was a strained, hopeless expression on the cruel countenance. His eyes were closed, and he appeared to be in a trance.

"What's he doing, Chief?"

"Keep ray guns trained on him," snapped Millstein. "He's a tricky rogue. I think he is trying to project his mind, perhaps trying to give mental orders to the crew on board his 'Avenger.' Well, Cromwell, I guess the Falcon's days are over. Subdue him with paralyzing rays. Iron him securely. Give him drugs to keep him asleep until we reach earth. Of course we will destroy the 'Avenger' first. That should not be so hard now, with the master mind missing."

The crazed eyes of the Russian opened. He began to creep on his hands and knees towards Millstein, who held a ray gun ready against trickery. But in the eyes of the advancing madman there was a dog-like look, the look of a beaten animal. There was a frantic prayer on the now sagging face. The Falcon was broken—defeated!

Frothing and puling at the mouth the massive figure advanced, came close to

the young scientist, and with trembling limbs struggled erect.

"Wait, Millstein! Wait! Don't drug me. Don't take me to earth!"

Then even Millstein was astounded, and for a moment greatly disconcerted as the crazed Russian suddenly snatched from his face a false beard and mustache. With incredulous eyes Millstein watched the cruel features of his enemy relax into softer lines.

"Don't you see, Millstein?" pleaded the beaten figure. "The Falcon is uncanny in his wisdom. It was the Falcon you talked to on the 'Avenger.' But I am not the Falcon! I am only his wretched tool. One of his many doubles. He drugs us with a strange drug. He holds our lives in his hand. Only he knows the antidote for the horrible drug he gives us. Even at this moment I must have the antidote or I will die. Don't you see? That is the way he keeps us in submission. He takes our brains, poisons us, and keeps us alive with the antidote."

Millstein stood speechless—amazed, as the man who had acted the part of the Falcon went on. The deception had been more than perfect.

"The Falcon has sent me to my death. He knew in his uncanny wisdom this visit to your ship meant a possible trap. He cannot be defeated. I must have the antidote!

"I am not the Falcon!"

Becoming alert with a mighty mental jerk. Millstein turned to Cromwell and gave the order.

"Quick! Turn full energy on all protective screens and rocket away full speed for five hundred miles.

"We may be attacked by the 'Avenger' at any moment from this on."

Then more grimly, "The Falcon is aboard his ship, and it's a battle to the death!"

It was at last to be decided.

CHAPTER IX

Heroism and Tragedy

MILLSTEIN, greatly worried, but more determined than ever to destroy the Falcon, was at the control board of the 'Nemesis.' The fast space fighter had been rocketed away one thousand miles from the "Avenger." For some time Millstein listened to technical information coming from various compartments of the space car. The fearless young scientist was in his element at the control instruments.

The Falcon had escaped—outwitted Millstein for the moment.

"Well, Chief," said the ever present and efficient Cromwell, "a message has just come in from our port forward hold that all the crew from the 'Avenger' have died. Even that tall, husky bird who was the Falcon's double has croaked. He was right about the poison in his body."

"That's the Falcon's way," answered Millstein. "He knew the men wouldn't live to talk much if they were captured. A clever fiend to trick me as he did. But after all I was lucky to get back to the 'Nemesis.'"

"What next, Chief?" asked Cromwell. "Shall we attack the 'Avenger'?"

"In due time," from Millstein in sharp tones. "I want to plan a sure attack that will not fail. I am certain the Falcan has a defensive screen for every weapon we have. The 'Avenger' is a most amazing ship. That crazed Russian is the smartest scientist in the universe."

"EXCEPT yourself," hastened Cromwell.

"If the remaining government ship could help us, we could attack and together wear down the power storage of the 'Avenger'. Jack, we've got to destroy the Falcon and his super-craft in order to save the world. The commander of the

government ship is under the control of the Falcon's evil mind; so that ally is helpless. There's only one thing left to do."

A worried look crept into Cromwell's face as he divined the portent in Millstein's voice.

"You don't mean, Chief, that you're going to——?"

"Yes, Jack," interrupted Millstein. "I'm going to ram the 'Nemesis' at full speed into the 'Avenger!'"

"I'm ready, Chief," stated the brave Cromwell, gulping a bit. "Let's go. Shall I tell the crew? We are all ready to die if we can wipe out the Falcon!"

"Good old chap," praised Millstein. "I knew you would do it, but you see, Jack, you and the crew are not going"——

"Not going, Chief?!"

"No, Jack. You and the crew are to take to the space carriers and return to earth. As soon as you are all clear a thousand miles, I will—well—I'll do the job up right." There was a slight break in Millstein's voice as a mighty emotion flooded him.

"It's the only way, Jack. We can't destroy the 'Avenger' with our equipment, and there's no time to develop new weapons. The oxygen is rapidly leaving earth. I've made up my mind. Get the crew together, and let's get it over."

Cromwell started to protest, but a glance at the determined expression on his beloved chief's face told him words were futile.

With swimming eyes, the courageous young Cromwell managed a sickly, lip-trembling grin.

"Righto, Chief, and crash him hard I would say about two hundred feet toward the bow from center. That's where you say the lenses are located, that are changing the cosmic rays."

Speaking hurriedly to smother his feeling, Cromwell phoned urgent orders to all parts of the ship—orders that scurried wondering men to the small space carriers in the bow and stern of the 'Nefesis.'

It spoke well for the crew's careful training that it was only a few moments when Cromwell turned sadly to Millstein.

"They're in the carriers, Chief. Every one."

"Everyone but you, Cromwell."

"Let me stay, Chief. I want to dash to glory with you. It will be a big kick. Please, Chief. I——"

Millstein reached out and grasped Cromwell's hand in a bone-cracking grip.

"GOODBYE, Cromwell. Get out now, old chap. Take the crew to earth. They need you."

"Goodbye, Chief. I——"

Cromwell's voice broke into a sob, and with a last despairing, pleading look, he leaped away.

After a moment Millstein spoke into a phone.

"All set, Jack? Okay! I'm releasing you all from the launching tubes."

Millstein pulled a group of levers while his eyes watched the reflectoscope. In an instant ten small space cars flashed away on their long journey toward earth. They were grouped in formation like homing geese.

With quick adjustments Millstein tuned a radio to make contact with Cromwell. In a trice he had attuned the wave.

"High tail for home, Cromwell. You may take my laboratories and personal effects. Now goodbye! and quit sending that mushy stuff. I'll be too busy."

Millstein grimly fingered the controls as he tooled his space-fighter further away from the 'Avenger.' He wanted distance—five thousand miles—to gather full velocity! He was a machine now—a nerveless, unfeeling mechanism, with just one idea in mind. He was utterly devoid of fear.

Carefully his eyes studied instruments and the reflectoscopes. He noted with a start that the government space ship was flashing along with his craft. Very close it came—too close. The risky proximity of the government ship set Millstein thinking. He watched it carefully. Perhaps the Falcon had divined his purpose and was sending the craft to defeat his purpose. Millstein did not fear the heavier and clumsier ship. His better equipped ship could easily evade the other, and the protective rays and screens of the 'Nemesis' were vastly stronger than those of the other ship.

Then the sudden, uncanny intuition that had so often saved Millstein came again to him. He steered the 'Nemesis' dangerously closer to the other!

Millstein knew the government ship was now in the effective area of his own protective ray screens. The strange intuition told him the move might develop something important.

It did!

Almost instantly the radio phone near Millstein's ear began to operate. The commander of the government space fighter was speaking!

In a few terse words Millstein explained the situation to the gallant officer. Millstein learned the commander had suddenly gone under some mental influence at the start of the battle. The officer did not know what had happened, and he was deeply grieved to hear of the loss of the other government fighter and the result of the attack on the 'Avenger.' Millstein did not tell the officer of his intention to ram his ship into the enemy.

"MY crew are all dead or mad. I am the only normal soul on board." The government officer's voice was a prayer. "What shall I do, Millstein? My crew are madmen. They are now trying to kill me. They are observed by some terrible mental influence. I have locked them out of the control room. They are trying to crash the door. I'm lost, Millstein. I'm going to ram the 'Avenger' I——!"

The voice in the phone ceased, and Millstein watched the other craft with anxious eyes. Suddenly it turned with startling speed and was gone!

"I guess his crazed crew broke the door down," mused Millstein sorrowfully, as he bent every energy and faculty to the task at hand—his last flight.

Turning the "Nemesis" in a wide, swinging circle, Millstein adjusted the reflectoscope to show the huge reflected image of the far distant 'Avenger.' He gradually fed full power to the atomic propulsion tubes. The 'Nemesis' became a long, hurtling meteor streaking through the heavens.

Faster and faster sped the 'Nemesis' straight toward the 'Avenger,' that grew larger and larger before Millstein's gleaming eyes. It would soon be over! A mighty crash—and disintegration!

Millstein—a believer—moved his grey, tense lips in prayer.

Suddenly he tensed! On the reflecting screen showed another flashing shape!

"The government ship!" gasped Millstein, realizing now that the courageous officer was far in front of him and indeed attempting to crash the "Avenger."

Millstein savagely turned on the last bit of his energy to increase his speed His eyes were glued to the screen. He saw unfolded a most horrible tragedy.

With a vast explosion the two ships ahead of him suddenly became a revolving mass of hurtling, mangled parts! Untold miles of the void were instantly filled with broken steel and fabric—to drift forever in endless space!

The sinister Falcon and his hell-ship, the 'Avenger,' was destroyed! Many gallant men had perished, and a brave officer had carved deeply his name in the halls of fame. But Earth was saved!

MILLSTEIN was badly shaken and impressed by the horror. But new perils for him now required his full mental concentration. His terriffic speed had carried his ship directly among the whirling, hurtling fragments—many of the fragments larger than the "Nemesis." A collision would mean disaster.

Playing his disintegration and atom exploding rays like fire hoses, Millstein in a few hours cleared the void of the large and dangerous fragments. With a fervent prayer for the heroes of the government fighters, he flashed away from the harrowing scene.

Already he had radio connection with the frantically happy Cromwell, who would soon be at his chief's side.

"Cut out that raving, Cromwell. I'm all right. Slow up and get ready to come on board. I'm tired."

Millstein's voice seemed to hold all the suffering of the ages. He had seen a man die grandly!

"It won't be long now, Chief. We'll soon be home, and what a home-coming for you!" Cromwell, at the controls with Millstein, was happy.

"The whole world is waiting to fête you. By the way, the last radio from earth states the oxygen is already becoming normal. What a relief to know the Falcon is dead."

For some time Millstein did not reply. He had been thinking—intently studying some mighty problem. He spoke slowly.

"Jack, I wonder about the Falcon. Why did he not attack us after I got back to our ship? It's uncanny. Not like him. It worries me a bit."

Sensing his chief was in an analytical mood, Cromwell resorted to their old custom to help Millstein think.

"Say, Chief, look there! High in the heavens. The mighty star Sirius."

"STRANGE, Cromwell, that you should mention Sirius. I was thinking of that star. Sirius, the Dog Star, as the ancients called it."

Cromwell grinned; he knew Millstein would give out information and thus stimulate his thoughts. Sure enough. Millstein began in a far-away voice.

"The ancients built temples, and pictured Sirius, the Dog Star, rising from the eastern horizon. They thought the star affected their happiness and the weather." Millstein went on academically and in an absent-minded tone.

"The astronomer, Bessel, discovered in Eighteen hundred and fifty that Sirius was moving among the stars in a wobbly path. This vast star is extremely heavy for its size. It's——"

Millstein suddenly stopped speaking as a strange light broke over his face.

"Jack, I've a hunch. The Falcon's factories are on that star! In a few weeks we will take a trip to Sirius and look around."

Cromwell was not heeding. His ears were fastened to phones connected to a powerful receiving radio. A look of incredulous wonder had spread over his face. His eyes were bulging with amazement.

"Listen, Chief, by the great cosmos! Here's a message from space. I'll repeat it."

"To my enemy, Donald Millstein. You thought me dead. I sensed a trap and escaped in a space carrier while you were being taken to your ship. You fool. Do not think I am finished. Beware! The Falcon will swoop again. It is war to the death!" Signed, The Falcon.

Cromwell choked and sputtered.

"Chief, what do you think of that? The Falcon is alive!"

THE END

On every side of them, in orderly receptacles, long rows of coffin-shaped boxes were resting on shelves—so many that it made one dizzy merely to look at them.

In the Footsteps of the Wasp

By STANTON A. COBLENTZ

Mr. Coblentz is one of the best liked authors with whose works we have been favored. In the present story he appears in the rôle of a short story teller and very ingeniously brings everything to a happy conclusion where a whole nation is rescued from tyranny and almost extinction. We are sure that our readers will enjoy it.

Illustrated by MOREY

HAD it not been for the example of the hunting wasp, the whole extraordinary episode would never have occurred. As professor of entomology at a South American University and specialist in the ways of the hymenoptera, Dr. Andres Mandano, had given prolonged study to those wasps which, as everyone knows, are able to paralyze their victims and leave them in a state of suspended animation, so that they may eventually form succulent living morsels for still undeveloped, reviving larvae. By what leap of the imagination the professor bridged the gap from insect to human and thought of applying waspish methods to mankind, is a question that will perhaps never be answered; but at all events we know that, after years of research, he had solved the secret of the insect poison, and was able to brew it in considerable quantities and to apply it in a practical way to mankind.

In the beginning, it appears, Dr. Mandano's motives were wholly laudable; for it had been his hope to develop a new anaesthetic which would supplant ether and make it possible to perform operations without inconvenience or danger to the patient. Could he have foreseen the relentless use that was to be made of his discovery, the unparalleled abuses and the vast upheavals that were to follow, probably he would promptly have hurled the formula into the ocean.

In any land other than South America of the twenty-first century, however, the formula might not have been perverted to sinister uses. But it will be recalled that a series of revolutions had but recently convulsed Dr. Mandano's home country of Peravia; that a military dictatorship had been established; and that there existed just that degree of popular subordination which made the so-called Mandana Man-Preserver a logical development. It will be recalled how public liberties had been curtailed following the rise of the revolutionary government of Rodrigo Querzal; how free speech had been eradicated, how labor unions had been destroyed, how Communists and non-conforming religious groups had been persecuted, how military demands and organizations had been strengthened, and how, finally, a compulsory sterilization decree had been adopted to cut off the progeny of undesirable elements of the population—in a word, elements opposed to Querzal.

What was more natural, accordingly,

than that the Mandano Man-Preserver be utilized as the culminating check upon the liberties of the masses?

BUT before going on to describe the actual use of the new invention, perhaps I should say a word as to its nature. It was literally what the name implies—the means of preserving men, and of preserving them over indefinite lengths of time. Not a mere method of keeping their mummified corpses! a method of keeping the men themselves in a state between sleep and death. An injection of less than one cubic centimeter of Dr. Mandano's paralyzing fluid, based on the formula learned from the wasps, would cause a man to collapse into a state of seeming lifelessness: he would cease to breathe, there would be no sign of heart action, his face would take on a waxy pallor which would show no sign of change during the course of days, weeks or even years; and yet, at any time, upon the injection of the proper antidote, he might be revived, feeling a little drowsy, like one awakened from deep slumber, but otherwise unaffected.

The secret of suspended animation, in a word, had been mastered!

But having been mastered, it was not employed, as it might have been, for humanitarian and surgical purposes. Instead, as the world in this good year 2054 is well aware, it became the nefarious tool of a political and social class.

It is not certain whether Dr. Mandano himself was involved in the misuse of his invention; or whether, beneath the iron compulsion of the Querzal dictatorship, he bent reluctantly to the will of the government and delivered over the paralyzing fluid into hands less scrupulous than his own. In any case, the result is in no doubt at all. Some evil genius, in an unlucky hour, conceived of the idea of preserving and storing the nation's excess man-power: of preserving and storing it precisely as one would preserve and store so many hams, herrings or dill pickles. Why not build huge warehouses, he argued, where all excess human beings could be kept and filed away for reference? Why not take all beggars and vagabonds, and put them into a state of suspended animation until the dawn of a better day? Why not seize all unemployed workers and their families, and, instead of allowing them to become a burden on the community, quietly paralyze them and leave them in registered compartments, until their services should be required, when they might be immediately awakened? And why not, in the same manner, build up a vast and irresistible army? Why not train as many soldiers as possible, and then, instead of continuing to feed and quarter them, put them into a state of inexpensive paralysis until the advent of war should make them necessary? In this manner Peravia might build up a matchless military machine at a minimum of cost.

It is needless to add that these arguments, though appealing to the principles of the Querzal government and though acted upon without delay, were carefully kept from public knowledge. Indeed, it is now believed that several political offenders, who in 2034 were summarily sentenced to the noose, had been guilty of nothing beyond some inadvertent suggestions hinting at the government's new project. Browbeaten and docile as the Peravian people had long been, there was no reason to suppose that they would countenance this un-heard-of, latest atrocity of their leaders; hence none but a few high government officials, a few military chieftains, a group of medical advisers, a handful of great industrialists and Dr. Mandano himself, had any suspicion of what was in contemplation.

EVEN when the plan had actually been put into operation, the law of abso-

lute secrecy prevailed, and the government proceeded by means of ruses and subterfuges designed to throw dust into the eyes of the people. The only public pronouncement was directly misleading: that, in the interest of the public health, a State medical examination of all citizens was to be undertaken, beginning on a particular date. In the systemmatic manner characteristic of the Peravians, all individuals and families were to appear at various assigned times before duly constituted Boards, who were to compile the most thoroughgoing "health census" ever known to history. Little did the unsuspecting common man realize that he was being made to walk into a trap!

In a majority of cases, it is true, that the trap was not allowed to spring; merely for the sake of appearance, millions of men were put through a superfluous physical examination. But in hundreds of thousands of instances—and eventually in millions—the citizen, in his ignorance, walked to a fate he would not knowingly have accepted without a struggle.

Hence it would occasionally happen that some man—more often than not an unemployed artizan or laborer—would disappear after being summoned for examination, and would not be heard of again. Or some stout and brawny youth, who had been undergoing military training in a private or public corps, would vanish as if swallowed up by the earth; or a whole family—always of the poorer classes, and often previously dependent upon charity—would fail to return from its appointed examination, and neighbors would inquire in vain as to its whereabouts. Officials, when questioned, would merely shake their heads with a "know-nothing" expression; the police would prove either unwilling or unable to be of help; the public press, being dominated by the Querzal party, would never so much as mention any of the missing; and the rank and file of the populace, if now and then their suspicions were aroused, would find that a word, indiscreetly uttered, would send them to a Concentration Camp if not to the executioner.

Meanwhile, in spite of the ferocious restraints of the Censorship Bureau, strange rumors were making their way through carefully guarded underground channels. Tales were told that made the hair of the listeners literally stand on end; tales that brought muttered oaths and curses to many an indignant lip, and that caused many eyes to stare in amazement or incredulity. One heard reports of intricately winding galleries which, like modern catacombs, were laden with innumerable bodies—and one was told that these were the bodies not of dead men, but of living. One heard wild stories of torture-rooms, where physicians, having stripped their unwary patients for physical examination, would slyly inject a hypodermic which caused the victims to reel over like men stricken suddenly dead. And one was assured that, by means of a carefully arranged card system, the multitudes of slumbering individuals were all placed and catalogued, each with his appropriate designation: for example, "1964 XW 2/17/34, automobile mechanic, unemployed, 25 yrs. old at time of suspended activities"; or, "4456 VT 3/11/35, trained infantryman, proficient in rifle practice, 22 yrs. old at time of S. A."; or, again, "TYU 1154, 1155 and 1156, 12/18/36, man, wife and son, dangerous radicals, 43, 37 and 13 at time of S. A."

THERE was still another report which, more ghastly than the others, was heard now and then in secluded quarters safe from the ears of government eavesdroppers. This concerned a secret incinerating chamber, where each day scores of unfortunates were brought for cremation. For Mandano's Man-Preserver, if these tales were to be believed,

did not always accomplish its purpose. Now and then some patient, either because of a weak heart or nervous shock or an excessive dose of the drug, would go beyond the stage of mere suspended animation, and the remains, consequently, would have to be disposed of as quietly as possible. But such cases, it was said, were exceptional, and caused the officials little worry; in fact, they were scarcely in excess of one per cent of the total!

But although ominous whispered reports continued to be circulated; although mysterious disappearances continued to multiply and although such cases were mostly confined to the humbler or non-possessing classes, the great majority of the citizens remained placidly unaffected. So severe was the censorship that many, perhaps, never heard the rumors at all; others, hearing them, refused to believe, or, believing, tacitly approved, since the new policy had sharply diminished the burden of unemployment and of public charity; while the majority reduced to the meekness of a jelly by the fury of political repression and well knowing the consequences of an unchecked tongue, chose not to inquire too closely into the reports.

And so the years from 2034 to 2043 slipped by and nothing had been done to restrain the use of the Man-Preserver.

But in the latter year there occurred a series of events which not even the wisest could have foreseen.

* * *

IT was in July of this year that, according to plans since disclosed, the Querzal War Department contemplated its Great Offensive. It was in July that the usefulness of Man-Preserving was to receive its culminating test; it was in July that Peravia, picking an excuse for war simultaneously with the neighboring lands of Argenzela and Bolador, was to revive millions of soldiers now waiting in a state of suspended animation, and, by one great overwhelming sweep, was to subdue both neighboring nations. At the same time, multitudes of slumbering laborers were to be brought back to activity, so that wartime industry might be properly manned; and the nation was accordingly to have a strength beyond anything dreamed of by her enemies or indicated by her census reports.

Such was the project; and there is reason to believe that it might have succeeded—had it not been for an unexpected factor.

That unexpected factor was to be found in the person of Captain Juan Cardenzos, perhaps the most persevering foe that the Querzal regime had ever encountered.

The record of Cardenzos had been a curious one. Decorated for heroism during the Equadorian War nearly thirty years before, he had become violently anti-militant after the Armistice, he had publicly destroyed his badges and decorations, and had worked ardently in the cause of international understanding and disarmament. Following the rise of Querzal to power, he was condemned to a Concentration Camp, from which he escaped after harrowing adventures, seeking refuge in the United States, where he remained for several years. But feeling that his native country needed him, he smuggled himself back over the border, and, living the existence of a hunted creature, carried on secret propaganda at the daily risk of his life. By means of spies and underground emissaries—for he had sympathizers even in the highest circles he gradually made himself the head of a vast organized ring, the so-called League of Free Men, which, working through subterranean channels, was vowed to overthrow the reigning tyranny.

A strangely assorted group they were—disgruntled clerics, Communists, thwarted laborers, disinherited intellectuals, women disenfranchised, and adventurers ready to clutch at any straw! Yet,

though they were so motley a crowd; though they seemed to have undertaken a hopeless task, and met with discouragement after discouragement; though many of their members were seized by the police and summarily executed, they were held together by the force of their convictions and became a greater power than the authorities were able to realize. But it was Captain Cardenzos that was their guiding spirit, and he it was that set off the spark which precipitated the explosion.

EVER since its formation, the League of Free Men had been investigating rumors concerning the Man-Preserver; indeed, it was probably through members of the League that most of the rumors started. But at first its efforts had borne little fruit other than in the martyrdom of several League members by the executioner's noose. It was not until 2043 that any decisive action became possible; for it was not until that year that Cardenzos was in possession of the now-celebrated "Devil's Secrets." How the knowledge came to him—whether through spies of the League, or through betrayal of the government by its own servants—has never been disclosed; but, in any case, he did gain information of the most revealing kind, and was moved to passionate indignation by word of the impending war with Argenzela and Bolador. And, at the same time, his secret agents acquired other information which made it possible for him to plan a way to block the war, and incidentally to accomplish the avowed purpose of the League by crushing the Querzalists forever.

The never-to-be-forgotten thirtieth of July, 2043, was the date set for launching the League Revolution. One gasps even in recollection to think by what means and against what seemingly insuperable odds Cardenzos and his followers began the revolt. Their exact numbers will never be known; but it is conservatively estimated that they were not more than five hundred in all when, on the evening of that memorable day, they quietly gathered before the gates of a huge building on the outskirts of the Capital—a building which, covering many acres with its huge squat form, bore the simple designation, "Government Warehouse." Ordinarily, armed sentries were parading before the entrance, but on this occasion they were conspicuously lacking; indeed, the gate itself, by what might have seemed a bit of official carelessness, swung invitingly ajar, and when Cardenzos and his band strode in there was no one to restrain them.

But mumbled passwords were quickly interchanged with a waiting party within; and the newcomers, as they surged through the passageway, cast casual glances at a dozen sentries strewn about them in a state of insensibility, and pressed hastily on to accomplish the night's mission.

GUIDED by maps and blueprints, they made their way through tortuously winding, electrically lighted passageways through labyrinthine corridors that not only filled the building but stretched underground in a long succession of basements; and into apartments suffused with vile-smelling concoctions reminding one of a mortuary chamber. On every side of them, in orderly receptacles, long rows of coffin-shaped boxes were resting on shelves—scores of them, hundreds, thousands, ten of thousands!—so many that it made one dizzy merely to look at them. And beneath the cellophane covering of each box one could distinguish a wax-like human face, silent and still as if in slumber.

Working according to prearranged plan, and yet filled with the fury of desperation, the rebels set about completing their victory. Several of their number

were posted at various entrances as sentinels; for the danger was not at all remote that their intrusion would be discovered, that they would be surrounded, imprisoned, and sentenced to death. Given a few hours leeway, however, and they would liberate the country. So they believed; and, firm in this conviction, several hundred of the insurrectionists drew, each drew from his pocket, little vials filled with a black fluid, and set to work over the corpse-like forms lying beneath the cellophane.

Strange beyond all words were the results. A single drop of the liquid, forced into the veins of the sleeper, would produce an almost magical effect. Instantly the patient's frame would be shaken with a convulsive shudder, his lips would draw apart in a yawn, his eyes would slowly open, and he would look up with a drowsy, bewildered expression, from which he would revive gradually into full consciousness. "Where am I?" would be his first astonished exclamation; and then, after an effort, his mind would go back to the moment of his official examination, the sudden stab of pain as the physician, taking him unawares, had injected the hyperdermic . . . and the ensuing blackness.

"Where am I?" he would repeat, in growing wonder and dread. "Who are you? . . . Where am I? . . . What has happened to me?"

"You are with friends," the League member would rapidly explain. "For years you have been sleeping, betrayed by your rulers. Now we, the servants of the people, have come to save you. We have learned the secret of your enslavement; have discovered how to make the drug that overcame you, and the antidote that has revived you. See! it is here in these little vials! Now join us! We will show you how! We have enough of the medicine to restore a million men. You must help us bring your fellows back to life! Then we will all join forces and march upon the oppressors!"

IN some such words the League member would appeal to each reviving man. Sometimes the individual would be immediately convinced, and would enthusiastically join his saviors; sometimes he could be persuaded only with difficulty; but in every case the sight of the long, dimly lighted, sepulchral corridors, with the innumerable coffin-like boxes neatly packed on shelves in the alcoves, was enough to fill the restored person with indignation against his betrayers and with a desire to join the League.

In the course of one brief night, obviously, a few hundred unassisted workers would not have been able to revive a great many thousands of sleepers. Yet, like the proverbial snowball rolling downhill, their efforts expanded from a small nucleus until all things were swept before them. Each awakened slumberer was provided with a vial of the black fluid, by means of which he restored dozens of his fellows to life; and each of these, in turn, resurrected others, who resurrected many more: so that, before morning, the halls and corridors of the whole vast building and its underground annexes were black with great surging masses of men.

And all these great masses, newly converted to the cause of Captain Cardenzos, were loudly uttering the war-cry of the League: "Down with the oppressors! Down with the oppressors! Onward for the freedom of man! Onward, onward, onward for the freedom of man!"

* * *

THERE are several things that have never been satisfactorily explained about the epoch-making first of July, 2043. One is that Captain Cardenzos, an avowed pacifist, should have resorted to the use of arms—though it is

difficult to see how he could have prevailed unless willing to oppose force with force at the crucial juncture. Another is in what manner he succeeded in recruiting an efficient army with such unparalleled speed and securing arms and ammunition. But the second question is more easily answered than the first: for it was not really Cardenzos that recruited the army; it was his enemies that recruited it. It must be remembered that more than half the men had been trained as soldiers and intended by the Government for use in the war against Argenzela and Bolador; it must be remembered, also, that abundant weapons and uniforms were at hand in great underground armories, conveniently placed near the man-storage chambers, so as to avoid unnecessary delay in case of hostilities. And when it is recalled that the revived men, by virtue of their very numbers, could easily batter down the doors of the armories and take possession, one should have no difficulty in understanding how Captain Cardenzos, on the fateful first of July, was able to place himself at the head of so great an army.

His military experience, acquired during the War a generation before, was now to serve him well. And yet his triumph was hardly a matter of military skill. Wherever he went, he was hailed, urged on and supported by crowds of people, long groaning beneath the Querzal despotism, and long powerless to defend themselves. And wherever he went, the enemy fled like rats hounded out of their holes by terriers. Only in a few fortresses and army strongholds did they dare to defend themselves, and even there they could not long withstand the popular fury; for they were deserted by the regular army on which they had placed reliance. After one or two battles in which the masses, though ill organized, prevailed by virtue of their irresistible enthusiasm, the surviving Querzalists scurried in multitudes across the national frontiers; while other multitudes were taken prisoners, or were brought down by the guns or swords of the onsweeping Revolutionaries.

In-so-far as he could, however, Captain Cardenzos curbed all violence and bloodshed, thereby showing a self-restraint rare among victorious rebels. But he gave orders that all captives be scrupulously guarded—and the sentence that he inflicted upon them was not only unique in history but represents one of the rarest strokes of ironic justice of which we have any record. No sooner had he been established at the head of the League government, no sooner had he announced the restoration of the Peravian Republic and been elected President by an overwhelming majority, than he proposed and carried out the punishment of "Scientific Incarceration" upon all leaders of the defeated party, upon the generals and industrialists who had urged the use of the Man-Preserver, and upon the physicians who had lent their aid in paralyzing millions of unwilling victims.

BUT what, precisely, was "Scientific Incarceration"? Nothing more nor less than Man-Preserving: the paralyzing of the culprit and his preservation in a state of suspended animation. In accordance with the Presidential decree, fifty thousand men and women were condemned to this novel penalty; and all of them, undergoing a sentence of indefinite duration, were stored in those underground labyrinths where their former victims had been secreted.

And there to this day they remain. All of them, it is said, have been systematically checked, numbered, and registered in a card catalogue, so that one can easily tell in what particular box and alcove to find Señor de Mattas, one-time baron of the armament makers; or General Fernandez de Leon, who planned the never-to-be-

consummated campaign; or Chancellor Manuel Carranza, long regarded as the "iron man" of the Querzalist regime; or Dr. Andres Mandano, who, on general principles, was sentenced to taste the effects of his own invention.

For eleven years already these notables and many others have been quietly slumbering where they will never do damage to any human being. And it is believed that they may be left undisturbed for another hundred years, or perhaps even for a thousand, since the Cardenzos regime is still ruling successfully, and no one has any further desire to experiment with the Man-Preserver or to revive any persons who know too much of its dread secrets.

THE END.

What Do You Know?

READERS of AMAZING STORIES have frequently commented upon the fact that there is more actual knowledge to be gained through reading its pages than from many a text-book. Moreover, most of the stories are written in a popular vein, making it possible for anyone to grasp important facts.

The questions which we give below are all answered on the pages as listed at the end of the questions. Please see if you can answer the questions without looking for the answer, and see how well you check up on your general knowledge of science.

1. What does the practise of law and of medicine depend on? (See page 13.)
2. How would the absence of crime and of sickness affect professional life and business related to it? (See pages 13-14.)
3. Can you give a theory about the connection of conduct and sickness? (See page 22.)
4. How is war defined by the author of "Life Everlasting"? (See page 24.)
5. Is mental deficiency a disease? (See page 25.)
6. How long were the sides of the southern triangle uniting Spain with the Balearic Island in the work of Arago, Biot and Rodriguez in measuring the arc from Dunkirk to Ivica? (See page 42.)
7. How long did the French observers watch for the light on a peak one hundred miles away? (See page 42.)
8. How fast would a vertical moving body have to go to escape from the earth's gravitation? the same for Mercury? (See page 58.)
9. Can you give a theory to prove that the planet Mercury has lost its atmosphere? (See page 59.)
10. How are the electrons disposed in the oxygen atom? (See page 60.)
11. What are the rates of vibration of different light rays? (See page 67.)
12. What is goldbeater's skin? (See page 73.)
13. How does the wasp provide living food for its young to be kept intact for long periods? (See page 91.)
14. What is the operation of the poison injected by the wasp into its victims? (See page 91.)
15. What is the function of the magnetograph? (See page 101.)
16. What are the characteristics of the magnetic north pole? (See page 109.)
17. Where is it now located? (See page 109.)
18. What suggestion is made for increasing braking power on automobiles? (See page 125.)
19. What human factor affects rapidity of action? (See page 130.)
20. How do the human eyes realize and estimate distance? (See page 131.)

North God's Temple

By HENRY J. KOSTKOS

This is distinctively a story of the cosmic order; not only that, but the composition of a planet this side of Jupiter is brought in, making us think of the asteroids or planetoids as they are properly called. Those who like tales of true adventure and of amazing happenings on this earth of ours, will specially enjoy this tale. Magnetism plays an important rôle in its plot. We have sciences devoted to the small and to microscopic organisms, while sometimes the very earth itself is taken as the basis of a narration, and here it is mother earth that gives us the story.

Illustrated by MOREY

OUT of the north came the call, strong and clear and compelling. Straight into the mind of Professor Darius Norton it penetrated as he bent low over a specially designed magnetograph in his laboratory at the Cosmopolitan Museum of New York. For many days he had been tantalized by the undecipherable impulses that came from the instrument to agitate his brain cells with weird bits of intelligence. Then, as if his nervous system had become attuned to the flashes or waves emanating from the device, his senses suddenly grasped the message, and, having once learned its import, he could not rest. It gripped him in its power with an impulse as primordial and compelling as the urge to live.

Could he believe his senses? Yes! In the mind of Darius Norton there was no doubt of the authenticity of that message. It came straight from the far north, from the base of the magnetic pole. And it would not give him peace, not until he obeyed its command and followed it to its arctic source.

It was on a quiet Sunday afternoon of a lovely June day—one of those rare days when the restless body and mind of the professor was in tune with the peaceful world. He dozed off momentarily on his laboratory stool, then awoke with a jar to find himself sprawled on the floor. Not only was he upset physically, but his mental equilibrium became a seething turmoil as the message surged into his inner consciousness, rising and fading spasmodically as it conveyed these enigmatic thoughts:

"We are the historians of the People of the Magnetic God . . . from a far planet we were hurled . . . penetrated the crust of the earth . . . entrance in Tana Fiord . . . into an ocean under the ocean . . . our race is dying fast . . . in the Temple of the Magnetic God. . . . "

It wasn't the message alone, which came as a translation of a strange, high-pitched foreign group of syllables into understandable thought waves, but a

Just as his fumbling hands finally focused his binoculars, a geyser of water shot up into the air for what must have been a height of a hundred feet, completely enveloping the boat.

compelling urge, a hypnotic power that gripped him and drew him to the mysterious and little understood regions of the north magnetic pole. Darius Norton was a man transformed with desire; his serenity had been caught in a cyclone that tore it to shreds. Into the chemistry of Professor Norton had been poured a reagent that took complete control of him. From that day on there was but one meaning of life for him—explore this mystery—and do so at once.

HE operated the magnetograph again and again, but the instrument was mute except for its orthodox function of recording the strength and direction of the magnetic force. But he had enough to go by. A sixth sense told him that he must first reach Tana Fiord, on the northern coast of far-off Norway. An expedition? That was it. And without further delay Professor Norton set about to do something that, under ordinary circumstances, his integrity would never have permitted him to consider.

He summoned his staff to the conference room. First and foremost was Raymond Cullen, his assistant and perhaps the only man in whom he had ever fully confided. The gigantic frame of Darius Norton, his flaming red beard, his eyes that flashed out to the world, the fanatic impulses of pure genius that motivated the man, *plus* a tongue ever ready to cast forth acid irony, made it exceedingly difficult to find any one possessing sufficient courage and tolerance to penetrate to the man's inner self.

As director of the Cosmopolitan Museum he had a staff of archeologists, paleontologists and other scientists, who had been acclaimed the world over for achievements in their respective fields. Yet it was always the professor's theory that the best way to further develop good men was to constantly keep them on their toes, and, in fact, to tread none too lightly on those same toes by subjecting all of their shortcomings to ruthless yet just criticism.

Now he had to gain their support and co-operation, for in these depressed times expeditions could not be authorized, even by the director of the world's largest museum, without reasons more substantial than the desire to follow ethereal thought waves coming from nowhere. He would have to resort to a subterfuge.

Professor Norton's eyes swept over the faces of his staff and he placed his long index finger on a map of the Arctic regions and boomed: "This was the location of the north magnetic pole during the Archaeozoic Era two thousand million years ago, when the great planet that moved between the orbits of Mars and Jupiter disintegrated into what we now call the asteroids."

His colleagues waited in silence for their director to continue.

"As you know, my observations and calculations prove that during the period of disintegration, countless millions of particles were violently hurled into space, and their path was such that many of them were carried within the orbit of the earth. They struck our planet at some heretofore unknown spot, but now, since my calculations and magnetograph observations have definitely fixed the location of the shifting magnetic pole during that period as the northernmost part of Norway on the shores of the Arctic Sea, it is there that I expect to find fragments of that once great planet."

"But what has the magnetic pole to do with these meteorites?" Raymond Cullen puzzled.

PROFESSOR NORTON pointed his bristling red beard toward his questioner. "The meteorites, as you call them, are composed of highly magnetic metals that were once a part of this

disintegrated planet." His booming voice was tinged with sarcasm that never failed to exasperate his listeners. "And as you know, Cullen, magnets have the peculiar property of attracting other magnetic substances, as a simple experiment will convince you."

Cullen reddened, but he did not appear offended; the others chuckled softly to themselves. So long as Norton hadn't directed his shaft of sarcasm at them, they could enjoy his sallies at the expense of some one else. But the next moment they glanced wryly at one another when the director stared fixedly at each of them in turn, and, in the tone of voice he would have used in inquiring into the cause of some unpleasant phenomenon that perplexed him, growled: "I wonder, gentlemen, why it is that I was destined to be endowed with the most stupid staff ever assembled under the roof of any museum? But you will undoubtedly be glad to know that I will not be compelled to rely upon your brains to produce any epoch-making ideas when we rearch the site of our excavations. All we will need there is some brawn. Here, here! Don't look at me with those bovine expressions. I'll make it plain: you guys will have to spit on your hands and dig!"

For a moment there was no sound except the sharp intaking of breaths by the eight men around the table. Then a babble of excited voices broke out: How soon were they to leave? How many of them were to go? Would they be finished before winter locked the northland in its icy hold? They were young again, alive with the enthusiasm of youth for adventure in far lands. There was not an individual who had not roamed back and forth over the world many times in the performance of his work, yet each expedition was a fresh adventure, holding out the lure of many fascinating discoveries.

Professor Norton held up his hand for silence. "We are scheduled to leave in ten days, gentlemen," he boomed.

* * * * *

THE rusty old tramp steamer "Seahorse" rounded North Cape after twenty-two pitching and groaning days across the Atlantic and up into the Arctic Sea. Professor Darius Norton, who had irritated himself into a black gloom, from which not even his own witty flashes of irony served to elevate him, now became more tractable as the end of the voyage loomed into sight. He had taken Ray Cullen and four other associates from the museum, and, in addition, Dr. Zuggler of the University of Copenhagen had joined the expedition at Stavanger, Norway. There was also a group of technicians and artisans, as well as laborers, who were to attend to the mechanical details of the heavy excavation work that Norton anticipated.

In spite of the director's dour manner and his ever-ready sarcasm, he had endeared himself to all on board, from laborer to distinguished scientist. There was something lovable about the man's idiosyncrasies, backed as they were by his superb intelligence. They all noticed how fanatic he was in his eagerness to reach the site of the excavation, and long before the "Seahorse" steamed into the mouth of Tana Fiord his geologist's tools and instruments were packed in a bag and on deck, ready to be taken ashore.

"Cullen"—his voice rumbled loudly in the silence of the lonely sea, and re-echoed from the bleak shore line—"there's something here that's big—I feel it, can't keep my mind thinking rationally; it wanders to all sorts of impossible and crazy notions. "I feel"—he pitched his voice low until it was no louder than a hoarse whisper—"that

there is something pulling me to these shores and that I will discover——"

BEFORE Norton could finish, he was hurled off his feet, along with every one else on deck, by the sudden stopping of the vessel, which halted its headway as effectively as if a giant hand had clutched its keel. There was no impact, as would have been the case if a subterranean reef had been struck, or even the soft drag offered by grounding on a bank of mud. Instead, the vessel was sucked down until her rails were awash, then released to bob up like a cork, while the propellers churned the water futilely. Slowly the unseen force swung the vessel around until her bow pointed in the direction from which she had come, and, as mysteriously as she had stopped, she churned ahead again.

It all happened so fast that no cry of alarm had been raised by those on board. Now the men on deck rushed to the stern to gaze shudderingly at a seething maelstrom of boiling water from which the vessel had emerged.

"What in the name of the devil could that have been?" Cullen asked Archeologist Gregg, alongside of him.

Gregg shook his head in bewilderment, then pointed excitedly toward a figure leaning out over the stern.

"Good God, Cullen, is that Professor Norton?" he whispered, not daring to believe his eyes.

It was indeed the professor. But the man had been transformed into a strange creature; his huge frame had dwarfed into the malformed body of a hunchback, his defiantly flowing red beard hung like a tattered curtain from a trembling chin, while the deeply tanned color of his face had blanched into the whiteness of the snow on the distant mountain peaks.

Cullen and Gregg reached the taffrail not an instant too soon. The professor had strained his body far beyond the limits of safety, and even as he lurched toward the water, the two men clutched his legs and hauled him inboard. The fact that he did not struggle, or even take notice of his rescuers, indicated that suicide had never entered his mind. It was some dreadful fascination, some unknown and terrible force that had almost drawn him into the seething white waters. Toward what, Cullen wondered.

They hurried him to his cabin, without being able to make head or tail of his mutterings. Even after he had been given a stiff jolt of Scotch, he remained inarticulate and groped with unseeing eyes at the bed-clothes in his berth.

"Go call the doctor to look him over" —Cullen drew Gregg aside—"and then we had better take turns to see that he stays put until we get ashore."

WHEN the expedition disembarked on the rocky coast and set up camp, Professor Norton became quite normal in his actions. He directed the work of erecting the tents and preparing the equipment for excavating. Only by his recurring fits of moodiness did he give evidence of something weighing on his mind. And on frequent occasions he stole away from the camp, carrying his magnetograph, and made for the headland, from which he stared fixedly out over the fiord toward the spot where the ship had been held fast by that mysterious force. It was during these periods that Ray Cullen so worried about the red-bearded giant that he invariably stalked him to the bluff, managing to keep out of sight, yet staying close enough to be able to reach the professor's side almost instantly if needed.

Whether by design or coincidence, about a week after the party had landed

on the bleak northern shore, Norton dispatched Cullen with a group of laborers to start the excavation work at a point he designated some distance inland. As Gregg was also assigned to the group, there was no one to whom Cullen could confide his fears for the professor's safety. So it was with misgiving that he got under way with his men and equipment. No sooner had the party disappeared from sight beyond the ridge of the hill, than Norton hastened for the shore, where the metal rowboat belonging to the expedition, was beached.

He hunched his giant frame to the task and hauled the heavy craft down over the rock-strewn beach into the water. With sinewy arms he sped the boat over the waves straight for the spot upon which he had focused his gleaming eyes for many days. In his eagerness to reach this mysterious location he timed his strokes in a loud booming voice that penetrated the silence of the bleak north. "One, two, one, two, one, two . . . " he chanted as his oars flew over the water.

Back beyond the hill Cullen stopped to listen.

"Hear that, Gregg?"

"It's Professor Norton," the archeologist cried with conviction.

Cullen glanced at the man significantly. "I'm going back there; something's up." And he was off on a run without waiting for Gregg's reply. Gregg joined him.

Panting for breath, Ray reached the headland and scanned the choppy waters of the fiord. Almost a mile out he spotted a tiny object bobbing up and down as it rose on the crest of a wave, then disappeared into the trough of the sea. There was no doubt in his mind that it was the rowboat with Norton in it, as there was no other human being in that vicinity, who could have been out upon the water. And the fact that the boat was directly over the spot where the "Seahorse" had been held helpless, verified his suspicion.

JUST as his fumbling hands finally focused his binoculars, a geyser of water shot up into the air for what must have been a height of a hundred feet, completely enveloping the boat. When the geyser subsided in a seething whirlpool, the boat and its red-bearded occupant had vanished from sight!

"Good Lord!" Cullen exclaimed, then ran like mad toward the camp for help in launching the heavy motor boat that was lying far up on the beach. The entire population of the camp rushed down and hauled the vessel out into the fiord. For two hours the boat chugged its way back and forth across the stretch of water where Cullen last saw Norton, but without any results. Not a single drifting object could they find which had belonged to the ill-fated professor. It was a sorrowful group of individuals that dragged slowly back into camp to mourn the mysterious loss of their leader.

* * * * *

WHEN Professor Norton reached the mouth of the fiord, his mind suddenly became rational. The mysterious force, this obsession, that had numbed his sound reasoning and transformed his mind into a thing of blind impulse, the inexplicable power that had drawn him to this horrible, yet fascinating spot, now left him. At once he realized the danger of his position, but it was too late to do anything.

With a hiss like the bursting of a hundred water mains, a geyser of spray and water shot up all around him, as an irresistible whirpool caught his boat in its vortex and twirled it around with the speed of a swift moving centrifuge. The cry of anguish that escaped from Norton's lips was drowned in the cres-

cendo of swirling waters that sucked his vessel down into its funnel.

The scientist's mind went blank as he saw himself sinking into a bottomless pit of green water. When he came to his senses, Norton was still in the metal row boat, but he could see absolutely nothing either ahead, behind or above. In fact, were it not for the swish of water against the sides of the boat, he would have sworn that he had landed in a coal bin in a dark cellar at midnight.

He groped his way cautiously toward the bow and then did an amazing thing. From a locker under the forward seat he pulled out a dish shaped object with wires dangling from it, then felt around in the dark until his fingers touched a switch. As he snapped it, a beam shot from the reflector he held and flooded the course of his boat with a brilliant white light. Stretching into the distance as far as the powerful rays could penetrate was a broad body of inky water, black and foreboding. As he swung the searchlight, the beams played upon rocky walls and a high vaulted ceiling.

Professor Norton was in a subterranean sea, moving along at a tremendous rate of speed, the walls flashing past him like the sides of a tunnel through which an express train was speeding!

He threw some chips of wood overboard. In an instant they dropped behind and were lost to sight. There was no doubt about it, his vessel was being attracted by a powerful magnetic force, as there was absolutely no current drift in the direction he was traveling.

Professor Norton chuckled softly to himself: "If I had told Cullen and the rest of the gang that I expected all this they would have had me in a strait-jacket before I could have finished my story."

Then he consulted a portable magnetograph he fished out of the locker, along with a box of crackers, with which he had secretly stocked the row boat for just such an adventure.

"HM, the magnetic force is stronger than I had estimated. Proves that slide-rule jugglery doesn't always pull the right number of rabbits out of the hat."

He amused himself, while leisurely crunching a cracker, by flashing the search-light around and studying the changing character of the subterranean passage. There was no fear that the light would be extinguished for lack of power, as he had provided an ingenious generator that operated when the swift-moving field coils in the boat cut the intensive magnetic lines of force in the tunnel. Green, slime-covered walls dripping with moisture, jutting rocks that reached out their sharp points to tear at him, the echoes of the lapping waters, black slimy shapes that rose to the surface, then disappeared into the inky water—all these would have unnerved a man made of less stout stuff than the red-bearded giant who impassively studied every passing characteristic on his strange journey. The temperature of the water was delightfully warm to his touch.

"Probably volcanic origin," he mused. "It's bound to become steaming hot before long."

But in this he was mistaken. The temperature of the water dropped steadily, the air in the passage became chilly, and finally frost appeared on the rocky ledges. Professor Norton donned the parka he had previously removed and was thankful for its comforting warmth.

Soon slabs of floating ice appeared, first as white patches in the distance, then the floes became denser until Norton peered with some alarm ahead of him to see a solidly frozen sheet stretch-

ing blue-white into the remote distance.

It was only a matter of seconds before he would be hurled at express speed against this sheet of ice which would surely crumple the thin metal hull as if it were an egg shell. He had to act quickly; no time to lose now. Just as the little vessel reached the solid ice, he threw his weight into the stern, and the bow of the craft shot high into the air. The bottom struck with a sickening thud that threw Norton's head forward until he thought that it had parted company with his spine; then, at slackened speed, the boat continued over the rough ice pack to the smooth frozen surface, over which it fairly zoomed like a swift flying bird. The powerful force had converted the metal craft into an ice-boat that slid along on its keel strips. Norton took a deep breath of relief, then huddled in the bottom with the searchlight pressed close to his body for warmth.

HE consulted his black note book. Yes, at the estimated rate of seventy-five miles an hour in a westerly direction he would reach his destination in about fifty hours, after passing beneath the Arctic Ocean, glacier-covered Greenland, Baffin Bay, Baffin Land and the Gulf of Boothia. But fifty hours spent in this weird, lonely place, speeding like mad toward an unknown destination, was not any too pleasant to contemplate, even for such a staunch-hearted scientist as Norton. If he had only taken Cullen into his confidence he was sure that his good friend would have joined him without an instant's hesitation. But now it was too late. The song of the runners over the ice made him drowsy; he dozed off, and finally fell into a deep sleep.

"Crunch, splash!"

His slumber was brought to an abrupt end by the boat breaking through the ice and sailing beyond into open water. The frozen sheet had terminated, and his course now lay through water once again. But a new element entered to disturb his equilibrium. The hours of friction over the ice had worn the keel of the boat down until it traveled along on the unprotected plates of the bottom, wearing the metal so thin that the water squirted into the boat in a heavy spray.

Norton seized a scoop and began to bail furiously, not daring to stop even long enough to take his bearings. How long he had slept, or how far he had traveled during that time he had no way of determining.

It was nip and tuck now between the rise of the water in the bottom of the boat and the speed with which he could work the scoop. Hour after hour he kept bailing, but it was a losing fight. Slowly the water rose, first to his ankles, next half way up his leg—then the light went out. The generator, which he had failed to inclose in a waterproof housing, had been short-circuited. True, there was his pocket flashlight, but he must conserve the precious batteries for future emergencies, for only God knew when he would be able to find his way out of this dismal subterranean chamber.

WITH head bent low and his mind on the immediate task of bailing, Norton did not see the dark solid mass that loomed up ahead. Steadily the boat bore down upon this obstruction. A collision was inevitable. As the bow of the vessel crashed into an unyielding substance, the professor jerked his head around and tried to jump. But it was too late. With irresistible force the boat telescoped itself into buckled and twisted steel plates. Norton's body fetched up hard against a hard substance and everything went black.

Slowly consciousness returned to the man. Living fires were searing his

frame; warmfi red blood oozed from a dozen cuts and scratches; one arm hung immobile and useless, with a broken collar-bone protruding through the torn flesh.

Looking around with dazed eyes, Norton found himself on a narrow plateau above the reach of the water. What remained of the boat had probably sunk from sight when he was hurled clear of the wreckage.

Cautiously he stretched out one leg, then the other. They, at least, were intact. After a half dozen exhausting attempts, he was able to raise his body on his shaky legs, and hold himself erect by leaning heavily against a cold, hard wall. Now he became curious. The scientist within him had taken control over the obstacle of physical pain and mental fatigue. He ran his hand up and down the side of the massive object. It was glass-smooth to the touch. With his good arm he managed to reach the flashlight in his pocket. Luckily it had escaped destruction.

He swept the beam upward. There, towering some two hundred feet above him was an obelisk-like tower of gleaming ebony! A hundred windows cut its smooth surface, while at the top, crowning the summit, was a huge ball studded with crystal windows that flashed back his light in a cascade of spectral colors.

Norton's eyes gleamed with a fanatic fire. Here was his goal, the proof that his researches and experiments had not been misdirected!

The base of the obelisk flared out to the platform on which he stood, and then disappeared from sight under the inky water. How much of it was below the surface Norton had no means of knowing, but he judged that at least seventy-five feet would be needed to stably support the mass of the huge tower.

When he attempted to walk he found his back glued to the wall. He tugged and pulled frantically, but to no avail. Then he grinned sheepishly and reached around for an object in his hip pocket. The heavy automatic pistol he pulled out immediately flew from his grasp, crashed solidly against the wall, and stuck there! It was the steel of the pistol which had held him. He was now released and free.

"Magnetite; although a thousand times more powerful," he exclaimed, examining the substance closely, "yet it is different from any mineral found on our earth. Yes, I am positive that this structure was hurled from some far planet." And he whispered in an awed voice: "The message was right, it must be the Temple of the Magnetic God!"

Working his way cautiously around the base of the structure, which he found to be octagonal and approximately fifty feet across, he came to the entrance he was seeking. A circular doorway, gloomy and uninviting led to the inside of the temple. He had left his pistol adhering to the outer wall, yet without any thought of fear, he boldly entered and flashed his light around. The next moment he regretted his lack of caution.

AS he turned his head he drew back with a jump, to stare right into the vacant eye sockets of a monstrous skull! And strewn about within the chamber were hundreds of other skulls and bones of the creatures who had worshipped and died here. The air was dank with the odor of death and decay, the walls were festooned with rotted draperies, the floor slimy from the ebb and flow of the water that had flooded the place periodically.

He nerved himself to examine the remains more closely. The bones were green with mould and crumbled to powder at his touch. It was evident at a

glance that the creatures who had used the temple for worship were not human beings in any sense of the word as applied upon the earth.

The skull was massive, measuring more than a foot across and shaped not unlike that of a huge bird, yet it had a high and deep cranium, denoting the possession of an enormous degree of intelligence. The thorax was short, and the thigh bones of the four legs unbelievably small; but the two arms, terminating in delicate phalanges indicated that the creature had twelve extremely sensitive fingers that could only have been possessed by a race skilled in performing precision work or operating complicated machines.

Glancing up from the bones at his feet, Professor Norton's eyes riveted themselves upon a circular opening in the middle of the vaulted roof. The opening appeared small to him below, but it was undoubtedly large enough to admit the priests of the temple to the chambers where they had lived and worked. The shaft was as smooth as the bore of a shot gun, and he could detect no means of reaching it to gain access to the upper part of the temple.

"They might have used ladders," he mused, "but creatures possessing the intelligence of these surely must have employed a more efficient system—some type of elevator, perhaps."

This thought gave him an idea. He took out his pocket knife and held it in the palm of his hand. "Whizz! It was whisked aloft straight into the shaft.

"That's the answer, a magnetic elevator! Now, to find the car."

He kicked away some rubbish and bones and discovered a circular trap door directly below the shaft. At first he imagined that it led to the basement of the structure, but he now realized that it had some bearing upon the mode of ascent. After considerable scratching around he found the combination, and as he pushed a button the trap-door sank down slightly then slid aside, revealing a car that resembled a huge iron pot. Boldly he stepped into it, and taking a chance, pulled a lever that projected from its side. At once the released vehicle shot up into the air and entered the opening like the plunger of a solenoid. Up it went, until it came to rest at the first level.

Eagerly Norton stepped out into a laboratory that was filled with strange looking machinery and instruments. With the eagerness of a small boy in a toy shop, the red-bearded scientist minutely examined every item and with fond hands caressed the fine mechanisms. Some of them he understood, but there was much more that puzzled him.

The problem of descending in the elevator was solved when after trying the various controls in the car, he discovered the one that served to neutralize the magnetic force, permitting the car to drop by gravity.

On an upper level he found the electrical generating plant in an operative condition. Fortunately all the metals used by these creatures were non-corrosive, which accounted for the perfect preservation of the equipment. He threw a switch, and at once the room, and in fact the entire tower, lit up with a soft sea-green light that illuminated perfectly without dazzling the eyes. Now he had sufficient light to continue his search for the thing that had lured him into making this perilous journey—the Records of the Magnetic God which he instinctively felt must be hidden somewhere in this very tower.

IT was three days before his search was rewarded by finding the records in a sealed chamber at the summit of the temple. The records consisted of a

strip of metal tape, wound on a reel, like a motion picture film. The tape ran through a complicated looking apparatus composed of coils of wire and tubes, to reappear on a take-up reel at the other end. And near by was the fast disintegrating remains of the last of the Magnetic people. Judging by the condition of its body it must have been alive not many months ago.

"This device must be the one that translates the magnetic impressions into thought waves, and was apparently operated recently by this creature to send out the very waves that I was able to intercept with my magnetograph back in the museum! Now to get it working again . . ."

This, however, was no easy task. Day after day he drove his pain-racked body to the almost helpless problem of discovering the riddle of this complicated piece of apparatus. It was not until three weeks that the tape gave up its secret. But in his weakened condition Norton felt but scant triumph. His wounds pained excruciatingly and the broken collar-bone was an added source of worry, although he had managed to bind his arm securely to avoid moving it.

At first he had faced starvation with a stoical calmness, but the pangs of hunger had driven him to swallow some pills that appeared palatable, whereupon he discovered that they contained all the nourishment he would need for many days.

Now into the brain of the red-bearded scientist the machine flashed the story of the great race who had worshipped in the Temple of the Magnetic God. And these thought-waves impressed upon his mind the struggles, the triumphs, the ultimate disasters that will always be the lot of all creatures of the universe.

The records told of a far planet that once moved majestically between the orbits of Mars and Jupiter, harboring a race of intelligent and scientifically advanced people who chose for their god that father of all power, Magnetism. Then came the catastrophe . . . the fierce terrifying temblors of their planet . . . its cleavage into a million fragments, which were hurled far into space . . . the landing of the temple upon the planet earth in what was now called Tana Fiord. Deep into the bowels of the earth, into a subterranean sea, the majestic temple bored its way, carrying its load of creatures. During its swift passage, the highly magnetized temple induced its magnetism into the body of iron ore through which it passed, and it was this force that held the "Seahorse" in its grip and pulled Professor Norton's boat into the passage. For on the earth there was no magnetic force prior to the coming of the Temple of the Magnetic God; this was the beginning, the origin of the mysterious terrestrial magnetism.

Gradually the creatures adapted themselves to the strange underground existence and managed to survive. They soon discovered that their huge magnetic temple appeared to change its location periodically. This was explained by the tendency of the magnetic drag, created by the tower, to hold it stationary, while the earth whirled around and away from it on its axis. The drag served to retard it so that it apparently made a complete circle around the north axis of the globe every 480 years.*

"Exactly the same period as the secular change of declination of the magnetic pole!" Norton exclaimed. "I wonder——"

* It has been long known that the magnetic north pole does not coincide with the true north pole, or the end of the earth's axis. This affects the course of ships at sea, and is called declination or variation. Not only does this variation differ in various parts of the earth, but it is constantly shifting in a westerly direction at the rate of one complete cycle in 480 years. At present the north magnetic pole is on Boothia Peninsula in Canada, approximately 70° north latitude and 96° west longitude.

HIS musings were interrupted by an awesome swirling sound. He looked down from the window at the top of the temple to see the black water surging upwards at an alarming rate. Down in the lower chambers the remains of the magnetic creatures, the machinery and the débris were already swishing about. Now the water reached the generators; the lights grew dim and went out. Norton climbed up high in the dome of the temple, clinging to a projecting ledge with his good arm. With blood-shot eyes he watched the black, inky fluid rush in through the elevator shaft, wash away the translator machines and the precious Records of the Magnetic God and reach relentlessly upward to gather him in its clutches.

Suddenly Norton held his breath and listened. Clearly he could hear it! Or was it a delusion? Coming from far off was the screech of the "Seahorse's" whistle!

The Temple of the Magnetic God swayed dangerously as Darius Norton struggled desperately to maintain his precarious hold. Then the water reached for him and sucked him into the seething maelstrom to disappear with a horrifying scream . . .

* * *

CULLEN stood on the bridge of the "Seahorse" when she slowly steamed into a cove on Boothia Peninsula. Tucked away in Professor Norton's duffle bag he found a hastily scrawled note. It read:

"It is futile to try to find me as by the time you read this I will be dead or many miles from here. There is one chance. Leave here at once and proceed to Boothia Peninsula, to site of present magnetic north pole and wait. Norton."

Now Cullen was taking readings of the force from the near-by magnetic pole with a unifilar magnetometer, when the needle of the instrument began to swing wildly. In his excitement he yanked the whistle cord to call his colleagues. The screech of the whistle reverberated over the silent wastes and re-echoed from the distant ice caps. It reached into the far corners of the north country, and deep into the bowels of the earth where the man who had discovered the secret of the magnetic pole, sank with his secret, into the waters that buried him forever within the North God's Temple.

THE END

OTTO VON GUERICKE—PHLOGISTON

We publish a most interesting letter from Mr. John A. Campbell, Jr. Some months ago in an editorial we spoke of an "error" in mechanics which was perpetrated by von Guericke in having one team of horses pull against another in demonstrating the Magdeburg hemispheres. Eight horses would have done as well as sixteen, if he had tied his hemispheres to a tree.

"Your editorial interested me, as usual, but *I* disagree with your point on von Guericke's hemispheres. I always felt the old boy was a darned good showman as well as a scientist. Hitching sixteen horses, against each other, is at least twice as spectacular as eight horses and a tree. If I had been in his place, I would do the same. There is more energy in a pint of gasoline than in a stick of dynamite—but most people don't believe it.

"And here is an interesting point on the old 'phlogiston' theory that I read recently. Remember that 'phlogiston' didn't really flourish after the weight experiments, so the futile attempts made to carry it over aren't true criteria of its worth.

"But—for 'phlogiston' substitute the phrase 'potential energy' and the old boys were dead right. They would say Carbon—phlogiston—carbon dioxide. While we now agree that: Carbon—potential energy—carbon dioxide. In other words, 'phlogiston' was potential energy!

"As a hobby, mainly, I'm working on a fuel battery. I have one made up in a water glass that will give as high as 8 watts per cell, and three cells run a flashlight bulb.—It polarizes though—but nevertheless it *is* a fuel battery."

—JOHN W. CAMPBELL, JR.

Shot Into Space

By ISAAC R. NATHANSON

This is a very interesting story of what might happen in the future to a high-speed rocket plane. A runaway horse is really a pretty serious thing in many cases, but he covers his mile at a mere fraction of the rate of a rocket plane, and this story tells us the adventures of some brave men who were rocketed off into space.

Illustrated by MOREY

ROOSEVELT FIELD was a scene of buzzing excitement. A vast multitude had gathered to witness the daring pioneers take off in their new rocket-plane on the widely heralded flight to "Europe in three hours."

From all sides they came; on foot and by motor, by train, by airplane and every other conveyance; crowding the highways and byways and every approach to the famous landing-field, eager and curious to be on hand for the epochal event. An army of guards were heroically battling to keep the turbulent masses from overrunning the entire field. Itching fingers, idle hands were with difficulty kept at a proper distance from the precious plane.

Three hours to Europe! A combination rocket-plane under full control, that was to cleave through the rarified atmosphere twenty to fifty miles above the earth's surface at unheard of speed!

It had never been tried before. Could they do it? Would they burst to pieces? Would they land alive? On every hand doubts and wonder were freely expressed; the tense excitement attaining a high pitch, as the moment for the great take-off drew near.

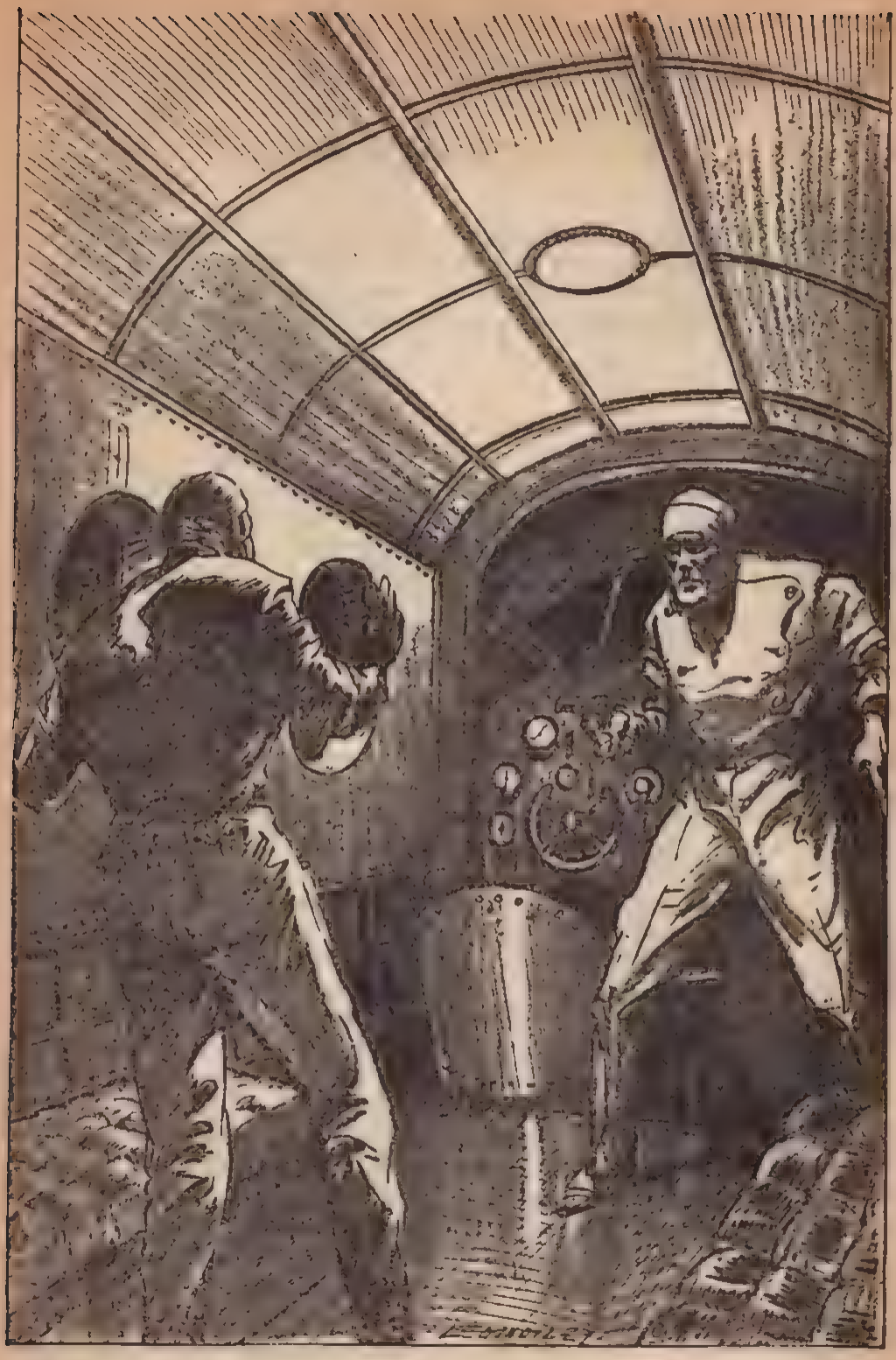
At one end of the field, carefully cleared of all obstructions, rested the *Meteor*, her shining wings proudly poised like some huge bird ready for flight; on her glistening sides emblazoned the confident legend, *"America to Europe in Three Hours."* Near the entrance stood the two men who were about to make history: Joshua Malcolm, inventor and pilot of the *Meteor*, and his aid and co-pilot, Edward King.

The great moment had arrived; everything was in readiness. With a wave of the hand to the expectant multitude, the brave aviators stepped inside and closed the hermetically sealed entrance to the double-shelled body. The faint hum of the air-conditioning machinery inside could be heard; the two aviators at the controls were visible through the quartzite ports. A strange silence fell on the immense multitude.

At the signal, the propellers began to spin. The *Meteor* moved forward, gathered momentum, took off lightly as a feather; and, engines roaring, sailed away.

A thousand feet up and rising steadily, her stern rocket tubes suddenly flared. Up, up and away the *Meteor* shot, leaving behind a long blazing trail from her fiery rockets; and soon disappeared into the azure deeps of the sky.

Fifty miles up, the powerful liquid



Slowly he backed away and stood in the corner of the cabin, cowed into furious submission by the levelled automatic in the hands of his companion.

propellant, hissing from the rocket tubes with explosive force, was driving the vessel toward its goal in distant France at a speed of upwards of twelve hundred miles per hour. Soon they were far out over the billowing Atlantic; the steady thrust of their rocket tubes speeding them on and on, higher and faster than any human being had ever gone before.

They had been on the way half an hour, Josh Malcolm and Ed King, as they sat at the controls, thrilling at their success so far. Inside their vessel everything was perfectly comfortable; the means for controlling the air pressure and temperature necessary to withstand the conditions which obtain at such extreme heights were operating perfectly.

Suddenly a frightful explosion shook the machine. As if some giant hand had all at once picked them up, they felt themselves hurled forward like a shot. The two men were thrown headlong, stunned into blank unconsciousness.

FOR a long time they were totally oblivious to all that was transpiring. Had an observer been present, he would have thought both had been killed by the sudden shock.

Josh Malcolm was the first to come to his senses. Dazedly he stirred and looked about him out of blood-shot eyes. A fearful bump showed on his forehead. Blood was oozing from an ugly gash in the scalp, head aching abominably, an excruciating pain in his right shoulder. He found it hard to collect his thoughts, and strove to rise, but fell back with a groan.

Gradually his senses came back; he remembered. He sat up, supporting himself unsteadily and looked around. Heaven, what had happened! Everything inside the *Meteor* seemed as before. His eyes roved to where Ed King was lying all in a heap, still unconscious—or dead. To Malcolm's dazed senses, the position in which the other lay struck him as ludicrous in the extreme; face turned sideways on the floor, knees grotesquely drawn up under him; his position against the corner of the wall preventing him from rolling over. A pool of blood trickled on the floor.

Collecting himself, Josh tried to walk toward his fallen comrade; felt himself queerly light, swayed dizzily and fell featherlike to the floor. Everything was swimming and turning. Yet, oddly enough, he had a sensation of utter calm and rest, as if they had landed somewhere.

He closed his eyes for a few moments; then, feeling better, raised himself to a sitting position and looked around. He was strangely puzzled by what greeted his eyes. Outside, the sky was a dead black, brilliantly studded with stars that blazed as he had never seen them blaze before. And yet—and this puzzled him the more—brilliant sunshine was streaming in through the quartz-glass ports on the startboard side. Otherwise, outside of the soft purring of the air-conditioning machinery, everything was quiet as a tomb.

Still puzzled, and wondering whether he was still in the flesh or only in the spirit, he made his way unsteadily, with a feeling of utter weightlessness, to where his companion lay. Ed was breathing. From a frightful gash on his head and from battered mouth, blood was flowing. Quickly as he could Josh stanched the flow. The unconscious man slowly revived, his eyes rolling wildly with pain and fright.

Presently with clearing minds, they took stock of themselves. Both were still weak and dizzy from the shock and loss of blood; but otherwise they suffered from no broken bones nor serious injury.

Upon looking out of the ports, they beheld an amazing sight. Aft of the *Meteor*, looming indescribably large, was

a brilliant globe, many times larger than the full moon; the wanly shining lunar orb by its side dwarfed and paled into insignificance by the size and brilliancy of the larger globe. In unbelieving amazement they stood and gazed on the wonderful spectacle; the truth beginning to dawn on their surprised senses.

"Heavens!" exclaimed Josh Malcolm; "it looks as if we have shot away from the earth altogether!"

A STRANGE unlooked for thing had happened indeed. Something had gone wrong, causing an enormous amount of the liquid propellant to explode all in one charge instead of firing steadily and under control, hurling the speeding *Meteor* far out into space away from the earth. The terrific force of the explosion tore away a large portion of the stern, including some of the rocket tubes, but fortunately leaving intact the air-tight cabin and other vital parts.

Experienced scientist and navigator that he was, it did not take Josh Malcolm very long to calculate within fairly close limits, their true position in space, and whither they were going—and they were not heading for the earth!

"Well—?" questioningly from Ed King, who stood near, as the other pushed back the sheets of paper on which he had just completed a long series of mathematical calculations. "How do we stand?"

Josh looked up, stared steadily at his companion, a serious expression in his dark brown eyes, seemingly hesitant about speaking his thoughts.

"Well, what have you figured out?" Ed spoke up impatiently; "are we on the way to Heaven, or—?"

"Ed, I'm afraid we're in for it. I'm loth to tell you where we are going; but we're not bound for our world. In fact, we're not going anywhere in particular—just going."

"What do you mean?"

"I mean that we are in His hands—God help us."

Ed stared at Josh in an uncomprehending manner, a look of terror gradually bulging his eyes wide open.

"We are now about thirty thousand miles from the earth," explained Josh to his terrified companion, "and still receding with the rate due to an initial velocity of 6.95 miles per second. As near as I can figure out, the sudden explosion of an enormous amount of the liquid propellant, coming just as we were already moving through the vacuous atmosphere at twelve hundred miles an hour clip, shot up far out into space. Lucky we weren't killed outright—perhaps unlucky," he added gloomily. "A trifle larger explosion, or at the rate of 6.98 miles per second, and we should have left the gravitational pull of the earth forever—although we are just as bad off either way. The *Meteor* is now a satellite of the earth—at least for a time."

"But isn't there some way we may guide her back to the earth?" came croakingly from Ed, who seemed to shrink within himself.

Josh shook his head mournfully. "None that I can see. This vessel was not designed for that purpose. If I start the rocket tubes again we'll only shoot along faster, and leave the earth altogether. At present I can see no way to change our line of movement."

The expression of wild terror in Ed's countenance heightened, and he turned away. "God, but I'm thirsty," he exclaimed presently; "I must have a drink."

"Wait, Ed; go slow," Josh cried, jumping up excitedly; the effort bouncing him clear to the ceiling, from which he fell slow-motion-like, back to the floor, bewildered and surprised at his inability to control his motions. "You know our supply is very limited. We've got to conserve, or——"

"I DON'T give a damn—the sooner over with it the better. Besides I'm terribly thirsty and I've got to have a drink." He looked belligerently at his companion.

"Well, you know what I mean, Ed. I realize you're thirsty after your loss of blood; and so am I. But we must ration our supply sensibly. Otherwise——" with this, Josh with some difficulty got between Ed and the all too mournfully small container. Carefully he drew a small quantity of the precious fluid and handed it to Ed, who drank eagerly. Josh drew an equally small portion and drank himself.

Then they ruefully examined their all too meager larder. Not counting on an extended trip, they had taken along a limited quantity of food. In fact, Ed had thought it foolish to take along anything but a few sandwiches at the most. But Josh, who was of an extremely provident nature, had decided it prudent, in the possibility of a forced landing, to take along a small supply of food and water.

A careful analysis of their dreadful situation disclosed that, with extreme husbanding, they had food for a few days, water for only about a week, and, providing nothing went wrong with the air-conditioning machinery, enough air and reserve oxygen to last twelve days at the very outside!

FARTHER and farther from the planet circled the two unfortunate men in their craft, their little world an infinitesimal speck in the immensities of space.

For days it had now been going on; the same cramped life, the same dreadful doom clutching at their hearts. To the despairing aviators it seemed that they were besieged—the mighty power of the infinite outside grimly waiting for their end.

The huge ball of the earth, gradually shrinking in size, hung in the dark depths of space; so tantalizingly near it seemed. It loomed big and beautiful, the ever changing outlines on its surface appearing, disappearing; now becoming sharp, here and there hazy and melting. The smaller ball of the moon seemed pale and insignificant beside the kaleidoscopic aspect of the brilliantly colorful primary.

But the two doomed pioneers now had no eye nor thought for the magnificent spectacle thus vouchsafed to no other living men. Hunger and thirst were tearing at their vitals. Stark fear and lingering death within: pitiless, cold space without.

Of the two, Josh Malcolm was holding out better, as men of stronger mind and nerve usually do. He took the dreadful predicament with remarkable stoicism. The other, however, was becoming increasingly restless; stark terror stamping him with its indelible mark.

Carefully and meticulously Josh rationed out their dreadfully fast dwindling supply of food and water; the while his companion watched his every move with jealous eyes. Morsel by morsel, drop by drop; the tiniest crumb carefully retrieved, their tongues licking the smallest drop.

"I can't stand this confounded thirst any longer," Ed exclaimed often and again, an insane look in his eyes.

More than once Josh forcibly had to restrain the thirst-maddened man from draining the pitifully limited supply still on hand. At times they came near to blows. Josh slept fitfully with one eye literally open, the precious remainder of food and water at his side. More than once he barely prevented the other from helping himself while he slept, awakening just in time to frustrate Ed's selfish attempt. The last time he was forced to strike the maddened man a sharp blow on the face to cause him to desist; and a fight was narrowly averted.

"We might as well eat and drink what is left," Ed said, "and end it all the sooner. I can't stand it."

To these demands Josh was adamant. His was the type of character that holds out unflinchingly to the end, never giving up. He continued a close watch on his companion.

Interminably the long minutes and the hours dragged by: each minute a day; each hour a year. Would the end never come?

THREE days since their last crumb had been consumed. They were famished and weak from hunger. A few small rations of water still remained to them, and when that was gone . . . Already they were drawing on their last reserve of compressed air and oxygen. The air inside was none too pure.

Every plan of forcing their living tomb earthward was futile; in fact there was no way for them to do so. They had no equipment even for going outside—no such contingency had been counted on by the inventor. The end now could not be far off.

Josh still kept up his daily observations, doggedly making calculations. He found that the radial velocity of the *Meteor* was gradually diminishing to zero; by this time having receded to about 300,000 miles from the earth—fortunately in a direction away from the orbit of the moon.

Then one day, as days were counted by his chronometer, his face lightened up. Eagerly he went over his equations.

"Ed, he shouted joyfully, "we are drawing closer to the earth."

Ed stirred himself from his torpor; advanced eagerly toward Josh. "Are you sure, are you sure?" His hands opened and closed spasmodically.

And then, after a further look at his calculations, Josh's face fell in hopeless dejection. "I'm sorry to have raised false hopes, Ed," he spoke sadly; "but I guess I rejoiced too soon. I find that though our centrifugal force is not equal to the gravitational pull of the earth, and though as a consequence we are now beginning to fall back to it—I fear too slowly to save us. It will take about a week before we approach the upper atmosphere, close enough for our wings to take hold and maneuver a landing. By that time . . . I don't think we shall be alive."

It was true. At first imperceptibly, then at an accelerating rate, the *Meteor* was drawing closer and closer to the earth. The initial momentum of its radial component was exhausted. Gravitation was now forcing it earthward; at first slowly, then faster and faster; until it would approach the planet with the same velocity of 6.95 miles per second with which it departed.

Josh took careful stock of their remaining few drinks of water and small supply of air. "Only enough air for five days at the most, Ed. We may last without food—but the water and air . . . Not enough for two. We are doomed!"

"You mean—our present supply is just enough for—for—that one could survive?"

Josh nodded. "I think so."

"But no chance for the two of us?"

The other shook his head negatively. Silently he turned to one of the ports and stood staring long and hopelessly at the pitiless emptiness without.

He heard a movement behind him, and wheeled around.

"I'VE just got to have a drink of that water."

"Not time yet, Ed; in three hours."

"But I tell you I must have a drink."

"In three hours we shall each take two swallows. For God's sake, Ed, keep your senses."

"Well then, let's toss up: it's either you

or I. There is not enough air and water for two; that would give one of us at least a chance to come through." And he looked craftily at Josh, greed and mad cunning playing on his features. "Let's draw; and whoever loses can put himself out with your automatic. I'd rather die than go on any longer where there is no hope."

Josh shook his head. "I'll not commit murder or suicide. It's share and share alike to the last drop and the last breath."

"You're a fool and a coward," hissed Ed.

Josh refrained from answering, and turned to look out of the window port.

Suddenly Ed threw himself upon him and snatched at his automatic, the only firearm in their possession, which Josh had been guarding carefully. They grappled and, both being etherially light and unsteady of foot, fell to the floor. In the struggle which ensued, Josh wrenched the automatic from the other's hand, and it fell like a feather to the floor out of the reach of either.

Weak though both were, they battled with frenzied energy, each striving to pick up the fallen weapon. They were about evenly matched for weight and strength. Josh drove a hard right at Ed, who dodged the blow which was absurdly ineffective due to their lack of weight, causing the former, however, to slip to one knee. In a flash the other leaped for the automatic, but was tripped headlong as Josh entwined his arms football fashion around the frenzied man's legs.

Over and over the two men rolled, bouncing, cursing and yelling, striving for mastery. The none too fresh air made them gasp for breath. Their struggle was a tragi-comedy-farce, ludicrous in the extreme; for at their distance from the earth they were practically weightless, their weight being only about 1/5800 as much as at its surface. They jumped and bounced and floated about this way and that, locked in each other's arms; their mightiest blows landing feather-like, their quickest motions ridiculously slow. It was like some silly dream, without control or effectiveness. In their ineffectual struggles Ed happened to bounce clear to the other end of the cabin, and Josh retrieved the automatic.

Ed rose slowly to his feet, eyes bloodshot, features distorted with meanness. Slowly he backed away and stood in the corner of the cabin, cowed into furious submission by the levelled automatic in the hands of his companion, who was facing him with set jaw and glinting eye.

"Stand still and don't move, Ed; or, by Heaven, so long as you are determined that one of us shall pass out—you will be the one. You're a dastardly coward, a treacherous hyena. For shame: I thought you were a man!"

Ed cowered sullenly, somewhat brought to his senses. "Oh, all right; have it your way. Soon we'll see each other in hell anyway."

"Yes, I *will* have my way. The least we can do in our terrible circumstance is to die like men, not like wolves. And now let us understand each other: At the least sign of treachery on your part again, I'll not hesitate, but shall shoot to kill."

FROM then on it became a strange contest, almost a curious form of siege. The two men kept a wary eye on each other, speaking but little, coming near only when it was time for Josh to pass out the scanty swallow or two of water. Ed would gulp his portion; then greedily look on as Josh slowly sipped his own portion, allowing the precious liquid to trickle slowly drop by drop past his swollen lips into his parched system.

The lack of sufficient food and water was telling heavily. Their mouths and throats were leathery and burning dry. To speak even was an effort. Faces were

gaunt and drawn; bodies thin and weak from hunger and thirst.

At times, and with increasing frequency, Josh himself felt that something within him must snap. Often he caught himself slipping into momentary lapses of consciousness, only to arouse himself with a jerk.

For he could not trust the slowly gathering insanity of the man before him. In their desperate plight the true character of the other was showing itself—his selfishness, his greed and ruthlessness. One never knows what lurks in a man until put to the test.

That Ed King was determined to survive if possible at his expense Josh now knew only too well. Except when asleep or in a stupor, the half insane man watched Josh's every move, never taking his eyes off him, although pretending to appear disinterested. Full well Josh knew that even if he did agree by lot as to who should remain alive with the last of their water and air, the other would not abide by the draw.

As things stood their situation was absolutely hopeless. If only they had provided themselves with a slightly larger supply of water and oxygen, just a few more days supply—foolish if—there would have been strong hope for both of them. But now, a horrible death for the two was inescapable, days ere their craft crashed to the earth with no one alive to control its downward plunge—unless—unless one or the other. . . .

Horrible thought! He could not bear it. His fibre was not made of that stuff. Countless of his forebears, long since gone and forgotten, had died for their comrades and for each other, for their country, for a cause. Into his innermost nature heroism had been burned on many a battlefield. He could not turn coward now.

And yet, life was sweet. He was so young. He hated to die thus. What had he done to deserve such a horrible fate! All his hopes and ambitions, all the wonderful things he had planned to do, to enjoy. He looked down at his feet, his legs; he studied his fingers, his hands; felt of his chest, his face—what precious things they were. And now, he would soon be forced to give up his body, so full of life and vibrant desire.

ED sat sullenly on the opposite side, mumbling and cursing to himself. Josh, too, was too weak to do more than sit and hope—hope for what! What miracle could happen!

Perhaps he *was* a fool. Perhaps . . . he ought to save himself, the only last desperate thing to do. Had he not always heard it said that self-preservation is the first law of nature? Assuredly the other would not hesitate a moment if the automatic were in his hand! Why not? Did not the other, by his very act of treachery, forfeit his life?—he, himself win the right to live? Was it wrong under the circumstance?—what would the world have to say about it? what would anybody else do if he were in his place? Or was he a fool to save his soul and lose his life!

Confusedly his tortured mind spun round and round the treadmill of his thoughts; his soul bitter as gall, his heart full of rebellion at his terrible fate.

No! He could not do it. The instinct of self-sacrifice and mutual aid, developed through the ages, and which had made man great, setting him above the beasts, was very strong in him, stronger than the instincts of the tiger and the wolf. He would not purchase his life at the expense of another's! He would die like a man!

HE was very weak and tired. He dared not allow himself the recuperative powers of undisturbed sleep. In that he was much worse off than his companion who perforce slept more than

he. Josh had to snatch his sleep in fitful dozes, automatic always in hand, weakened senses on edge.

During his dozes he dreamed a great deal. Always he was drinking great drafts of cold water, breathing deeply of fresh air, or feasting luxuriously. He dreamed he was at home. Through the open windows, looking out on their beautiful garden, delightful breezes blew, wafting to his nostrils the sweet smell of green and growing things. In front of him, piled high, was a table full of food, the huge pile on his own plate seemingly growing bigger as he gorged and gorged, his wife urging him to eat, saying there was plenty more. And at his side was a tall goblet of sparkling water which he emptied continuously, yet somehow never seemed to have enough.

Something made him open his eyes, he knew not what. He had forgotten himself, had fallen asleep. Over him, looming huge and gigantic to his startled senses, stood King, hand upraised, clutching a large wrench, ready to strike.

Instinctively he ducked, and received a blow on the shoulder. Before his enemy could deliver another blow, he grappled with him, striving to pull his automatic; but the other was too quick for him, and prevented him from firing. Arms wound around each other, they began to enact the same tragi-farcical dance; Ed struggling to free his right arm which held the wrench, the other striving to employ his firearm.

Josh fought desperately with the frenzied half-mad King, who kicked and clawed and gouged and bit. In their struggles the automatic was discharged; a stream of bullets pierced the madman's body.

Josh tore himself loose. His enemy lay quite still. He never regained consciousness.

Exhausted from the desperate struggle for his life, and weak from lack of nourishment, Josh lay down and fell into a long needed sleep.

ALONE in his silent tomb. A motionless figure, the upper part of his lifeless body and his face covered, was outside, moving with the *Meteor*. Poor Ed. From the sunward side, the fierce rays of the sun illumined every nook and cranny of the interior; oddly enough it seemed, for the brilliantly star-studded blackness of space showed against the ports.

Inside, the air was close and fetid, although, thanks to the radiant energy of the sun, comfortably warm. He was on his last reserve of compressed air and oxygen.

Two days since his swollen dry lips had drained the very ultimate, last drop of water. Not a bit of food had passed his mouth for over a week. Yet this he did not mind so much. But that dreadful thirst! Sometimes he was tempted to open the outer exit and let the inrushing cold end it all in merciful instantaneousness.

Two days yet ere the *Meteor* would reach the outermost molecules of the earth's atmosphere. He must husband his fast-ebbing strength; felt he could hold out if only the air would last that long. He knew that when his vessel began rushing through the outer confines of the vacuous atmosphere, he must have sufficient strength to start the motors, must guide the craft safely to solid land —must not allow too swift a rush through the heavier layers of air to prevent burning up like a meteor. His great velocity must be retarded slowly, gradually, while still scores of miles up.

He husbanded every ounce of his strength, lying perfectly still most of the time to conserve the vitiated air. Now and then he continued his observations. The *Meteor* was now approaching the earth on a fast in-running spiral. The

huge body of the planet now filled more than a quarter of the sky. Soon, soon, the crucial process of landing would tax his knowledge and skill.

WHILE still miles above the surface, he had started the engines—a supreme effort for his lone and wasted strength. But they were now going; the propellers spinning.

He made ready in plenty of time. The very sound and feel of the throbbing motors was like sweet music to his ears, a sweet caress to his tortured nerves.

Not a drop of water for nearly four days. He was gasping for the air, which was now almost unbreathable. Any unlooked for delay in landing would be fatal.

Summoning all his remaining reserve of strength through sheer power of will, he stood tense at the controls. Underneath, the surface of the earth loomed welcomingly, immense and wide, bathed in brilliant sunshine. He could make out no details even with his glass. Everything was completely obscured by a vast storm-area; the outerside of the cloud banks reflecting the dazzling rays of the sun.

He was moving through the silence with frightful speed. Any moment he would begin to feel the retarding pressure of the outposts of the planet's atmosphere. He must be careful . . . careful . . . descend lower slowly, when resistance against the body and wings shall have reduced his terrific velocity to within safe limits; then proceed under his own controlled power to a safe landing place . . . life and happiness. . . .

At last he began to feel the cushioning effect of the resisting atmosphere. Moving as he was at the residual enormous velocity, the wings of the *Meteor* met sufficient resistance, even in the all but empty space, to control his rate of descent. As the friction against the body and wings gradually reduced his velocity, he allowed the vessel to settle lower and lower.

Slowly he settled; still going at five thousand miles an hour—three thousand —two thousand — steadily decreasing. Lower and lower, slower and slower; the now cloudless vistas beneath drawing near. Thank God!

He was over land; too weak and dizzy to care where; anywhere so it was a safe place to land. Green fields, trees, roofs of houses, the landscape melting and swimming before his eyes. His knees sagged. . . . Ah, a large open field. He must land—land. . . .

A heavy thud. As if in a dream he felt the *Meteor* bump along the ground and come to rest . . . blessed land!

He felt himself going. With his last remaining strength he reeled drunkenly to the exit. With his last shred of will he unsealed the locks—shouts, voices . . . funny; things were getting dark . . . the floor rising toward him. . . .

A STRANGE face was bending over him; two faces—no, several. Who were these people? What was he doing in that bed?

He heard murmuring voices. Funny—he could not understand a word; such odd words. He turned his head and looked around. White room; white clothes—where in the devil was he!

Someone was holding his hand, feeling his wrist. A pleasant-faced man, with a closely cropped beard, was leaning over him, talking with such senseless-sounding words in a strange language.

He closed his eyes; inhaled deeply of the blessed air; luxuriated in the sweet-smelling sheets. He opened his eyes again: the smiling face of a white-clad girl; a glass tube at his lips—cooling water . . . he sucked greedily.

He was in Holland, after thirteen days and twenty one hours in space.

THE END.

Photo Control

By BERNARD BROWN, B.Sc.

This contribution from an English author, picturing the London of future days, and telling of Robots, has an application at the present time when automobile accidents are so frequent. We are always very glad to receive stories from abroad. It is so interesting to see how the science fiction world is treated by those whom we conceive, justly or unjustly, to be the more conservative English.

Illustrated by MOREY

SLOWLY the bent old man trudged along the broad avenue which still bore the name of the Strand—that inadequate and traffic-glutted thoroughfare of the nineteenth and twentieth centuries. But the rows of shops had long since vanished and in their place one found boulevard refreshment gardens and rest rooms. Where Charing Cross station used to rear its ugly head was now the entrance to a park, with streams and shady walks and all the green pleasures that Nature could offer.

Down the middle of the avenue tall trees waved softly in the summer breeze, and here and there a bird chirped.

For London was changed. Gone were the narrow roadways, gone the noisome food palaces where hundreds clamored for their portion of preserved edibles; but, most of all, gone was the deafening roar of traffic, of harshly applied brakes and the occasional morbid crowd, betokening that some unfortunate had been unsure of foot.

But the old man, whom we will call Williams, saw none of these things. Each painful step brought him nearer the end of his yearly pilgrimage. For each of the sixty years he had made the journey ever since the first year when the streets of the cities of the world ran with blood.

At length he reached Remembrance Square—some still connected it with Nelson and Trafalgar—and paused to survey the assembled throng. Many thousand there must have been, but they seemed strangely silent, and not a few bowed their heads as though in sorrow.

No longer surly lions guarded the emblem of the victor. Instead, a circular pool rippled, cool and inviting. In the middle of the pool was a tiny islet, and in the middle of the islet a single tall pillar of green, rising to a great height, overshadowing the buildings. For towering skyscrapers had long since passed away and the sun of heaven again illumined the earth.

Close by stood a group of young people, excited yet hushed. Someone whispered "A minute to the hour," and Williams turned his head. They were young; they did not remember. A tremor shook his frame and he would have stumbled but for the help of a stranger who looked at him curiously.

"It is all right," he mumbled; "quite all right, thank you," and the young man smiled and rejoined his friends. But in that instant Williams heard again the

Violent braking, violent acceleration, sudden swerve, spin round a corner, stopping, starting, all were carried out with utter precision. And there were no accidents.

mad laugh of Stewart and saw those slender fingers hurl a hundred million to perdition.

Suddenly a curious silence fell upon the multitude. It lasted but a moment; then the air became filled with a clarion burst as of bugles. They beat into the brain and woke wonder and fear and slowly died away while the slender pillar of green in the center of the islet pulsed to a blood red.

Silence—to the old man, death itself. And yet it brought back memories more vivid than life.

* * * * *

While still at college Bob Williams had met Vera Stewart and, like most others, immediately fell in love with her. It seemed, however, that Bob was to be the lucky one.

Soon she took him home and there he met her father, Jason Stewart, even then famous as an electric light engineer. It so happened that Bob was specializing in light and electricity, and he found much of interest in Stewart's conversation.

As a matter of fact they became fast friends over a protracted argument. Just about that time there was a boom in robot manufacturing, and Bob was enthusiastic over what he was certain promised to be the greatest era of mass production. There had always seemed to be definite periods when production along one particular line held the field. The first was that of the early automobile; then of radio, though he could never really understand how people could enjoy the voices of artists they could not see. Others came afterwards—the aeroplane, the televisor, the rocket car. But between each boom was a lull, when huge factories lay silent awaiting a fresh advance of civilization.

Now from every poster and every sky-sign flared advertisements for robots. Secretaries, kitchen maids, porters —a robot for every job, and at a price which every household could efford. No longer would the rich alone be able to enjoy the infallible service of mechanized brains. Huge factories were pouring them out in thousands a day.

In short, Bob Williams rejoiced in the day of the cheap robot.

"Nonsense, my boy," remarked Stewart; merely a passing craze."

But Bob was too young to bow to superior knowledge, and argued.

"The robot or mechanical man is an absurdity," pronounced Stewart. "If you have a dish-washing machine operated by a handle, do you buy a robot to turn the handle? Of course not, you change your washer for an electrically motored article.

"The same thing applies everywhere. In the machine shops, do they use robots to operate hand screw machines? No; they junk the screw machines and install automatics.

"A robot as people know it is a redundant device. Certainly it makes an obsolete machine, requiring manual adjustment, free from that disadvantage. But that is just its fault and why it cannot last. When anything becomes out of date it should be scrapped and not given a new lease of life by another invention. Redesign, lad, and don't try to patch up!"

But Williams argued that a mechanical servant could be set to do many things, while an automatic machine performed only one function. Stewart countered by pointing out that specialization was the greatest modern tendency. And so they went on for a long time, while Vera fretted with the televisor and doubtless promised herself a fitting revenge. Still, at the end they became fast friends, which ended in Bob gratefully accepting Stewart's offer of a position in his research workshops when he had graduated.

The work was interesting and he showed such promise that within a year he became Stewart's chief assistant. Besides carrying out routine research for several large corporations, Stewart was always working on his own and derived a steady income from several patents on photoelectric relays, which were his especial forte.

Bob found life increasingly good. During the day he was absorbed in his work, and in the evenings enjoyed the company and friendship of Vera. Naturally their acquaintance had developed, and one evening, after a jaunt to Brittany in Stewart's rocket plane, they made the age-old vows.

Vera, besides keeping house for her father, a widower, spent much of her time in welfare work. Slums and suchlike sordid appendages of early civilization having long since disappeared, leisured feminine society had to turn to fresh fields of endeavor. Lately the craze had been the providing of ambulance depots and cars along the lesser roads. Every day scores of accidents occurred, and often the injured remained beneath the wreckage for hours, since the regular ambulance authorities were far too busy with the troubles of the highways to be able to tend the wants of sportsmen who chose to roar around country corners at eighty miles an hour.

Her father did not approve of this side of her activities, but, as usual, gave in to her deands. At dinner one evening he was expounding to Bob his ideas on the subject.

"If fools treat the roads as racing tracks they deserve to break their necks. For years engine performance and chassis design has been improving. Speed has crept up until a hundred miles an hour along the mainways is considered quite normal. But the fools seem to forget that, although maximum speed may increase to almost any figure, the limiting factors for safe driving are braking distance and brain reaction, starting from the instant of danger. Cars to-day can travel three times as fast as they could in 1930, but their braking distance has remained the same. The best you can do with a wheeled vehicle is to lock your wheels. As a matter of fact maximum braking effort, which means the relative coefficient of friction between the wheels and the road, peaks just before actual locking takes place."

Bob nodded.

"A case of dynamic and static friction," he suggested.

"Exactly. I can't think why the authorities have taken no hand in the matter, which has been growing worse and worse for the past decade. Speeds have grown out of all proportion to braking power and individual reaction. In the old days the average person driving at forty miles an hour was able to avoid accidents by quick application of his brakes or a swerve at the wheel. Now speed is quicker than thought, and so safety becomes a matter of probability. Of course the roads are better and automatic police signs help a lot. But accidents do not happen at cross roads. It's only on the flats that automobiles show their astounding increase in maximum velocity. In fact 'catching at the word,' that is the cause of all the casualties. What used to be a variable speed has degenerated into straight line velocity because there is no time to deviate.

"Vera is late this evening." Bob essayed to change the subject into more pleasant channels.

"Yes"—Stewart seemed to ponder—"she tells me her infernal club has appointed her Lady Guardian of the Northern Byways."

"Ah, well," laughed Bob, "I expect

she won't be long, for we've arranged to slip over to the Yarmouth coast to watch the sunset."

But Vera did not come home that evening, and it was late before the visaphone told the tragic tale. She and two of her friends had been tending the injured at a corner ambulance—one of the transportable type—when a huge car driven apparently by a madman had skidded at the curve and flung its two-ton weight full at the little caravan. Two girls had been killed immediately—Vera was one of them.

Bob heard the fateful news from one of the servants, for Jason Stewart had locked himself in his room. "It was terrible, sir," the white-faced butler stammered. "I thought Master would have gone mad. He swore and stamped about the room. Spoke about revenge. And then cried like a baby. I daren't call him, sir."

Bob Williams in those few words saw his pleasant world spin into utter space. His mind seemed broken from its anchorage and for a moment he thought of suicide. But even the deepest sorrow passes quickly in youth. He flung himself to work, wrestled with his problems till he was too tired even to think, and then often fell asleep at the laboratory bench.

It must have been three weeks after the terrible accident before he saw Jason Stewart again. He seemed to have grown ten years older. His face was white and drawn with suffering, but his eyes shone curiously bright. Not a word did he say to Bob, only patted him on the shoulder.

Not only did Stewart appear to have changed physically—his whole outlook had been refocused. He spoke little, but Bob soon discovered that the nature of their experiments was undergoing a change. Stewart had grown greatly interested in friction, and especially its application to synthetic rubber preparations. Literally hundreds of dynamometer tests were carried out and curves plotted. But, strive as they would, the very best adhesion they could obtain gave results only seven or eight per cent above the normal.

One day, after many hours protracted work, Jason Stewart suddenly flung down his slide-rule.

"It's no use," he cried bitterly. "The thing is impossible."

"Impossible?" Bob stared; it was so unlike Stewart to use such a word.

"The maximum coefficient of friction is unity, and in practice it cannot, of course, be attained. I had thought by suitable preparation of materials and surfaces to cause extra adherence through suction. But, no; it is impossible."

"Is that the problem, sir?" asked Bob, looking him straight in the eye.

Jason Stewart turned and stared out of the window and then spoke in a metallic voice.

"I intend to make traffic safe. The first factor is that of more efficient braking. To obtain greater grip on the road surface I must raise the coefficient of friction between the tires and the road metalling. Under favorable conditions we have managed to do so by a few per cent. That is useless for my purpose. I must enable vehicles to stop in one-tenth their present distance.

Metal on metal has a coefficient of about .3. Leather on metal is about .4. Ordinary tires on road surface give .6. We have raised it to .7. Useless——" His voice trailed off almost in despair.

Bob Williams stared at him. Not that the idea was new, but because he had never before heard Stewart speak in so unscientific a manner. He had touched only one factor of the problem

and despaired because he had been foredoomed to failure by a physical law. Stewart was not good to argue with in these days, so it was with decided nervousness that Bob gave his opinion.

"Surely, sir, there are other aspects of the problem?"

"Yes"—tonelessly.

"The adhesion between two surfaces depends upon the coefficient of friction between them, and on the force with which they are pressed together."

Again Stewart intoned metallically:

"It is approximately independent of the contacting surface area and decreases with an increase of speed, its culminating maximum being the friction of repose, which theory I have elaborated. I am already aware of such things, my boy."

Bob flushed but still pursued his objective.

"So far we have worked only on the actual coefficient. What about the other variable, the pressure of the two surfaces one against the other?"

"If you increase the weight of a moving vehicle," stated Stewart, "you increase the braking effect, but at the same time the inertia of the whole moving body increases to a like degree and one factor nullifies the other. Were this not the case, heavy automobiles would have a much smaller braking distance than lighter ones. As it is, there is practically no difference except what is due to decrease in wheel bounce, a mere three or four per cent."

"But to increase the pressure without adding to the weight," persisted Bob.

A faint smile crossed the features of Stewart.

"You would require a gravity attractor, I am afraid," he replied, "and so far this has resisted attack. Gravitational force cannot be generated without mass."

"But the old-time electric rail cars gripped the rails magnetically and could stop in a very short distance. Couldn't something after that style be brought out?"

"Rubber being practically nonmagnetic it is out of the question, even if we built the roads of iron." Stewart smiled sourly.

Bob thought for a moment then.

"If it were possible to add to the weight of an automobile without increasing its inertia, that would solve the problem?" he queried.

"Yes." And Stewart turned slowly away.

All that night Bob wrestled with the question—to add weight without inertia. It seemed a paradox, but at the back of his mind he was sure there must be a solution apart from the question of a gravity attractor. Even that itself was bound to be done some day, but all experiments up to that time had been fruitless. He racked his brains—weight without inertia—almost as bad as mass without weight.

Eventually he rose from his bed, and, slipping on a dressing gown, strode out to the veranda. A fierce wind howled around the building and caused him to shiver. Strangely enough, the sky was clear and he stared mechanically at a Transatlantic Helicopter majestically sweeping along to the west. Wind had no terrors for that monster of the skies, which held steadfast in the teeth of the fiercest hurricane. Man had conquered the air, but was defeated by problems of his natural medium, the earth.

A fresh gust of wind caught him, and he was forced against the railings. Still the Helicopter held its way, with its score of giant vertical screws roaring in defiance. Of course, it was the screws which held it steady—their gyroscopic action steadied the craft after the style once employed in ocean-going ships.

Suddenly Bob gripped the railings hard. The gyroscope!

Back in his room he worked feverishly until he was called for breakfast; then, ignoring the meal, made haste to Stewart's laboratory.

"I believe I've got it, sir," he greeted the engineer.

"What?"

"Weight without inertia was all wrong."

Stewart raised his brows.

"We do not even want to increase the actual weight of a body. What we do want is something, some pivot to use as a fulcrum for a lever to force down the wheels. The weight of the car does not matter if we can get a rigid pivot. Wait a minute, sir," he pleaded; "I'm not mad. The gyroscope will do it!"

Stewart wheeled round.

"The gyroscope?" His brows puckered in thought, then smoothed out. "I wonder!"

"Don't you see, sir; once you set a heavy wheel spinning, it strongly resists a change in its plane of rotation. Take a gyroscope big enough and fast enough. Couple one side of its cradle to the axle of a car and then, as you apply brakes, increase the length of the coupling arm by any sort of toggle. The gyroscope refuses to change its plane, and so the wheels are forced down by the toggle lever and you get as much friction as the tires will stand!"

Stewart's eyes were blazing.

"If dimensions worked out, that certainly would do it, lad."

"Yes, but I've worked it out for an average car, sir," waving a sheaf of papers excitedly. "An 18-inch wheel with a plane centroid at 8 inches radius and weighing about 40 pounds would be sufficiently rigid to squash flat the tires of any ordinary car inflated to 30 pounds per square inch. Oh, the speed. I forgot that. About 100,000 revs per minute, but that's easy using mercury bearings. Besides, it would take hardly any power from the car."

Stewart nodded.

"We'll get to work on a design immediately. This is the first step."

* * * * *

After several weeks' work, in which elementary tests had shown the practicability of the idea, their first full-sized model was completed and ready for trial. An ordinary type of road automobile had been adapted for the purpose. In the first place the idea had been to place a gyroscope both at the front and at the back, so that both sets of wheels would be affected. Experiments had shown, however, that with a relatively small gyroscope slung in the middle of the chasis, levers could be arranged to transmit the pressure to back and front alike.

The brakes themselves were of the ordinary hydraulic type, operated by a single small foot brake, much after the style of the earlier automobile. Both Stewart and Williams were fully aware that this arrangement would have to be modified before the design could be put to commercial application, but it would serve for the time being.

From the main oil pressure cylinder, whence brake shoes took their feed, another pipe passed to an extra plunger operating in another cylinder. One end of the latter was pivoted to the cradle carrying the gyroscope, while the plunger itself was linked through toggles to the front and rear axles, which had been modified for this purpose. On depressing the brake lever besides the brakes acting in the ordinary manner, a terrific pressure was exerted on the gyroscope, tending to throw it angularly from its plane of revolution. Due to the persistence with which the gyroscope retained its plane, a high degree of

pressure was exerted through the toggles upon the four wheels, which therefore were driven down hard on the road.

The completed machine was wheeled out of the workshops, and Stewart and Williams stood eyeing it speculatively. Dynamic friction tests had been satisfactory, but both were curiously dubious about its road performance.

"D'you think I'd better 'phone over for a test driver?" suggested Bob.

Stewart shook his head vigorously. "Certainly not; the machine is all right, and I see no reason why we should not make the tests ourselves. Come along."

With these words he took the driver's place and Bob clambered after him. As the magnetic clutch came into operation and the car shot forward with the customary violent acceleration, Bob felt a sinking doubt about the advisability of Stewart doing the driving. Normally Jason Stewart was level-headed and calm, but now the very devil seemed to have seized hold of him, and throwing caution to the winds, he swung round a turning and headed for the Great North Main Way leading to the Metropolis.

It was about 9 o'clock in the morning and the real traffic crush of the day had not yet commenced. Nevertheless they rarely had more than 40 or 50 feet clear before them. Hundreds of cars of all sizes and shapes roared their way towards London.

"Speed's rather high this morning," remarked Bob, glancing at the meter, which hovered between 80 and 90 miles an hour.

Stewart made no answer, but, depressing the throttle further, passed between two cars with a bare inch or so to spare at the sides. They had proceeded in this dizzy manner for some minutes when suddenly a metallic crash smote their ears, followed almost immediately by the shrill scream of harshly applied brakes.

A terrific force seemed to take hold of Bob and flung him forcibly against the dash. At the same time something ripped away at the back, flinging their car broadside on.

Bob struggled back to his seat and found Stewart nursing his wrists. The rear of their car had been crumpled like so much matchboard by a huge roadster behind.

"What the devil's happened?" Bob glared furiously at the other driver, who sat at the wheel, a dazed expression on his face.

Stewart gripped his arm excitedly. "It works!" he ejaculated.

For the moment Bob was completely nonplussed.

"What?" he demanded.

"The brakes. Don't you see what's happened. I put 'em on immediately, the same as the rest of the drivers when they heard the crash ahead. We stopped too quickly for the fellow behind, who has done us a bit of damage. Still, that doesn't matter. The great thing is the idea's all right."

But the driver behind had a different opinion on the subject, and it was some considerable time before the usual formalities were concluded and once again they maneuvered themselves into the stream of traffic, which between times had grown to much greater dimensions. After the first misadventure Stewart was more careful, but even so found it very difficult not to pull up in too short a space.

Passing through London in this manner, they drew away to the South.

"We'll take to some of the country ways," remarked Stewart, "so that we can carry out a few trials without further mishap."

Considering the fact that the weather was delightful, the country roads were

comparatively free of traffic. They drove along for some miles and were shooting down hill at a good pace when Stewart jerked out quickly:

"Hold tight; I'm going to brake."

Bob clung on for all he was worth, which was not much. Again he felt that unpleasant sensation, as if someone had butted him in the stomach, and he and Stewart extricated themselves from the front of the car.

"Not bad," murmured Stewart, clambering out. From his pocket he drew a large roll of tape and between them they measured up the braking distance.

Stewart had depressed the lever as they passed a particular gate, so that there should be no doubt about the stopping distance.

"Just over 17½ feet," he announced.

"What was the speed?" asked Bob.

"Exactly 94 and on a down gradient of 1 in 7, but we must check this again."

After entering up the particulars they backed up the hill and made a similar giddy descent, this time being less fortunate in the result. Bob sustained a severe cut on one arm, where he was thrown against the windshield, and one of the rear tires burst. Stewart, however, was delighted, though he spoke little as they slowly retraced their way through London and back to the workshops.

As soon as they reached home, mechanics were set on the job of stripping down the wheels and brake mechanism, so as to determine how much wear had taken place, and whether anything had been severely strained.

"It's no use relying too much on theory, my lad," said Stewart, catching Bob's curious eye. "We have done a lot in the last few years in bringing design down to the standard of pure mathematics, but you can never be absolutely certain of the factor of safety. The human element is far too great to cut down strength to the very minimum which after all is the object of true design."

Bob nodded. "We shall have to make a good many changes before we try out that old bus again. Have you any definite ideas?"

"Yes. We shall be able to lay down a few principles and get Smithson to work on an entirely new model. I am afraid we shall have to re-design the chassis. We can probably make use of the existing motors, although their acceleration is far too low for our purposes."

"Too low?" Bob raised his eyebrows. "Why, only the other day I thought you were complaining that acceleration was far away in advance of the rest of design."

"Yes, it *was*" rejoined Stewart curtly, "but let's go over the points in question which our mishap this morning has brought to our notice.

Back in the office they talked the matter over at length and eventually Bob drafted out a series of proposals which were to be passed to the Chief Designer who was to commence work immediately on a more elaborate model. Briefly, they were as follows:

(1) In the first place, examination of the tires and wheel rims showed straight away that each time the gyroscope had been applied the complete tire had been flattened so that the rim itself bit on to the metalled roads. This was the reason why a burst had occurred. Since it was practically out of the question to inflate tires to a higher pressure on the score of comfort a new method was to be tried. By the side of each driving wheel was put another wheel some three inches smaller in diameter, the tire made of a solid ring of hard rubber. Under normal conditions this was just clear of the roads and played no part in ordinary driving. So soon as the brakes

were applied and the gyroscope toggles drove the car down to the face of the road these solid wheels served for braking purposes. By this means they hoped to eliminate bursts and at the same time enable even greater braking pressure to be used if necessary.

Stewart also postulated that they would have to develop a material more resistant to abrasion than the common type of synthetic rubber, but this would not be difficult since their experiments had previously extended rather fully into this field.

(2) It was found that the brake shoes themselves besides being badly worn had in places fused. Beryllium, long since used as a material of construction in car design, would have to be replaced by something capable of standing up to higher temperatures. Again, some methor of cooling of the brake drums would have to be adopted. Stewart proposed to incorporate a small refrigerator such as then used on racing cars.

The greatest problem of all was the elimination of the human element of braking together with its inevitable time lag. It was all very well to design and develop super-efficient brakes, but even they would be of very little use in preventing accidents if put under the control of any Tom, Dick or Harry, who had enough money to buy a car.

In the weeks that followed, Bob spent most of his time in the workshops, supervising the construction of the new machine with its strengthened brakes and chassis members. Experiments on the synthetic rubber had been entirely satisfactory and they had decided on a material composed of the usual elastic bonding agent and floculated asbestos which gave astonishing results on dynamometer tests.

Stewart had retired to his private laboratory whence he issued only at meal times. He was hard at work on the other side of the problem but gave no indication of the direction which his endeavors were taking.

Bob felt rather irritated at this attitude, for he could not help remembering that it was his own particular idea which had brought the gyrobrake into being. What little spare time he had at his disposal he spent wondering how Stewart proposed to rule out the trouble of brain reaction. In fact he went to several demonstrations of the newly developed robot chauffeurs, which however, had not yet gained the sanction of the Transport authorities. What he saw at the demonstrations did not impress him very much, for, although the mechanical men seemed capable enough of controlling a vehicle under simple circumstances, it seemed very doubtful whether they would be able to show up well under the terrible traffic jam of the Metropolis.

One day Stewart appeared in the workshop with a whole sheaf of drawings under his arm and called Bob to his side.

"I think the problem is pretty well cleared, my lad," he said in a curiously tense voice.

Bob was full of questions, but Stewart was unduly reticent.

"We'll let Smithson get busy with these drawings and incorporate them in the new model, and see how it works."

With this Bob had to be content. Days passed quickly and days into weeks and slowly the new machine grew.

At last came the day when it was completed. It resembled the ordinary road car, except possibly its construction seemed a trifle sturdier and the wheels were, of course, novel. To the front two curiously shaped headlamps were placed at the lateral extremities on a complicated swivelling arrangement. Bob noted further that these apparent lamps were twisted slightly inwards and instead of

pointing towards the ground were directed straight out.

He was examining the foreign parts of the car when Stewart came along.

"You're due for a little explanation, I think."

"Well, to tell you the truth, I had begun to wonder when you were going to tell me."

Stewart patted his shoulder. "I'm sorry, my lad, but I have been very busy and very worried, but that's past now. Let's have a look at the 'bus."

"What's the idea of these head lamps?" asked Bob.

"They're not headlamps, of course," rejoined the other. "Actually they are carefully prepared and focussed telelenses at the back of each of which is situated one of the new ribidium photo-electric cells. But perhaps I'd better start at the beginning."

Bob nodded.

"Well, it's like this," proceeded Stewart. "From the first it was clear that it was out of the question to leave the direction of a car fitted with these new brakes to the varying abilities and reactions of a human driver. The question was then to replace personal control by something mechanical or, to be more correct, electrical, since this is somewhat outside the sphere of mechanics. A little consideration of the question showed that each car when driven at a particular speed required a zone of safety in front of it extending just over the width of the car and to a distance slightly greater than the stopping distance at the speed at which the car was driven at that particular moment. By some means or other this speed zone had to be maintained. You see with your gyroscope we can pull up a car driven at 90 miles an hour in, say, 15 feet. Good enough, but the time taken in braking and bringing the car to a standstill is very much less than the actual time taken for the driver to see the source of danger, transmit this to his brain and from the brain to the various nerves and muscles down to his toe on the pedal. Good braking alone would only make the whole question of driving control more dangerous, much after the style that acceleration has worked havoc in the past years." His eyes shone brightly. "But I'm getting away from the subject. You know, of course, how we are able to judge distance?"

"I suppose because we have two eyes," suggested Bob.

"Exactly. Our eyes are set apart and so when we look at an object they point inwards and the subtended angles gives us immediate indication of the distance that the object is away. Not exactly, of course, but at least to a degree. On my arrangement, I duplicate these conditions by what you refer to as headlamps. These are always trained ahead of the car and inwards to an extent depending on the speed. Actually their mountings are coupled indirectly to the road wheels so that the faster the wheels rotate the lesser is the angle subtended between the two sets of lenses. In other words the faster the car goes the further away is the point of intersection of the two beams. This distance is on this particular model four feet greater than the minimum braking distance at the particular speed.

Immediately we are afforded a means of noting whether the distance between the front of our car and the rear of the vehicle in front of us is safe. I had thought in the first place to build an apparatus after this style giving an audible or visible indication, but, after all, it would have been practically useless, for the brain-lag would come into the question again when the brakes had to be applied immediately.

"As the thing stands now photo-electric cells are placed behind the lenses

and as soon as any body falls within the zone of safety the photo-cells are affected and, operating on a relay, apply the brakes to the full."

Bob thought for a moment. "It seems a very good stunt," he admitted at last, "but does it take into consideration the speed of any object? What I mean to say is—supposing you are driving towards a building, I can see then that your trained photo-cells snap on the brakes and prevent you crashing, but supposing instead of its being a building it was another car coming in the opposite direction at a speed about the same as yours. You might pull up in time, but what about the other fellow?"

"Oh! of course," he laughed uncomfortably, "I forgot that all the cars would be fitted in this manner. Still," he went on, "I'm not sure that I see it yet."

"Steady, steady, you're quite right," Stewart assured him, "but I'd thought of this already. When I said that the photo-cells operated as soon as any object was brought within their field, I was only stating the action roughly. As a matter of fact, although they do operate in that manner, they are also sensitive to infra-red beams, which you have probably guessed are used through the lenses."

"I see," Bob nodded. "That seems all right. I suppose it works though?"

"Of course it works, or will work!" Stewart was rather tart. "There are one or two points that I have not mentioned. For instance rounding corners. I suppose you have noticed that the car has no steering wheel?"

"No?"

"This has been replaced by a simple right and left key switch. When the driver wishes to take a turn to the right he throws over the switch just before coming to the turn. Immediately the photo-visor lamps swing to the right, their angular speed being dependent on the speed of the car at the time. This is adjusted so that road grip under worst conditions is sufficient to counteract the inevitable centrifugal action of the mass of the car. Later on, we can probably arrange that wheel pressure is increased while taking turns, so as to permit faster and safer cornering."

"Again—"Stewart continued, "but no, a demonstration will be better than all this talk. However, I can tell you straight away that all factors of road conditions have been taken into consideration. You can visualize the action of the safety zone quite easily. Besides being connected with the brakes, it also acts on the accelerator, so you can imagine the traffic of the main roads and the city itself. Speeds raised even higher than they are to-day—all cars mechanically controlled by their photo-zones. As soon as any object or any other car or a pedestrian gets within the zone so soon do the brakes come on. As soon as the object is removed the car accelerates to its maximum. If the object does not move the zone swerves first to the left and then to the right seeking out its own path. At corners the driver flips his switch and the zone swings round accordingly seeking a safe path. As it rounds a corner the gyro-pressure is applied automatically depending on the speed. This particular piece of apparatus will be fairly easy to devise and we shall probably profit by experimenting on the mercury pendulum."

"Can't you see them?" Stewart's voice rose, "hundreds of cars, thousands of cars, mechanically controlled driven down the main roads and through the cities, all the cities of the world, driven at break-neck speed 90, 100, 200 miles an hour. All mechanically controlled. No danger, no accidents, mechanical perfection everywhere. The human factor entirely eliminated. No cries of the broken and crushed. No ambulances. Absolute

safety with maximum speed. The traffic problem smashed at last. My God, if only we had done this before—before . . ." his voice trailed off.

Abruptly he turned away and Bob was left staring after him.

* * * * *

Bob Williams stood alone in the temporary tele-visor studio at Transport House. Curiously he inspected the apparatus. Much of it was known to him, but this branch of science had progressed at such a pace that it needed a specialist eye to comprehend the functioning of each detail. He moved towards the great windows and stared down the Strand with its turmoil of traffic.

It was a great day for the world. Perhaps the greatest day for a hundred years. At 12 o'clock that morning traffic all over the world was to be "synchronized" as the news bulletins called it. S y n c h r o n i z e d—brought into time brought into step with the times.

Bob stared again at the traffic. A turmoil truly, but an ordered turmoil, not the bustling blundering of human hands but the steady, infallible rush of mechanised science. Each of those thousand vehicles below him were travelling at high speed, but none crashed, none were in danger of crashing. Violent braking, violent acceleration, sudden swerve, spin round a corner, stopping, starting all were carried out with utter precision. And there were no accidents.

London had been like that for nearly a year, as had New York, Paris, Berlin and the other great cities of the world, but on that day the safety zone and the gyrobrakes were to be made compulsory for every vehicle on the face of the earth. Heavy penalties, brought to the equivalent of attempted manslaughter, were to be applied to any one found driving manually-controlled machines. Not that anyone would have dared. It was impossible in that tear of traffic for an humble brain to respond quickly enough to avoid almost instant anhihilation.

The three years which had passed since their first test had gone quickly. Bob felt older, indeed looked older, but the time had gone in a flash.

Stewart, too, had aged. Now at his day of triumph it seemed that the fires of life were almost spent. He had grown thin, emaciated, but, with a declining physical strength, his eye had grown brighter, his brain more alert than ever, albeit there had been strange lapses. He had grown fond of his own company. Sometimes he would shut himself in his room for days and see no one. Something was wrong with Jason Stewart. Bob felt it, was sure of it, but he could do nothing, for a curious sort of barrier had grown between them. They were still friendly, the best of friends ever, but still the barrier was there.

Bob was afraid that the loss of his daughter was still preying on Stewart's mind. A lump rose in his throat as he thought of the girl who might have been his wife.

"This day shall be consecrated to her memory. The world shall ring with her name. They shall remember. Ah, they will remember. . . ."

Curious words these, but stranger still coming from the lips of Jason Stewart.

An official entered the room an enquired whether Mr. Stewart had arrived.

"No," Bob shook his head. "He said he would probably be late. He has much work on his hands as you are probably aware."

"Yes sir, but he will be here half-an-hour before the time. You see," he went on, "it is not very often that a world tele-broadcast is carried out, apart from the main studios and it requires a little adjustment beforehand, although

we have made tests for the past week or so. Most of them have been satisfactory, but they have had some trouble over in China due to the recedence of the Heavyside layer around that quarter."

Bob nodded. He was not greatly interested in China or the Heavyside layer. Like Jason Stewart, he too was thinking of Vera.

The official came closer. "I suppose, sir," he said, "Mr. Stewart will be using his apparatus to-day?"

"Apparatus? What apparatus?"

"Oh, I thought you knew, sir. In the next room Mr. Stewart has been experimenting for a month or so on some new idea. He mentioned once that he would probably be using it to-day."

Bob shook his head. "I'm afraid I don't know anything about that. I haven't seen Mr. Stewart much lately."

A quarter of an hour later Stewart entered. He shook hands with Bob nervously and avoided his gaze. Without a word he made to a side door, unlocked it, and disappeared within. The whine of generators broke through the silence of the room, rose in pitch and disappeared as it passed the limit of audible frequency. Ten minutes, twenty minutes passed and the crystal indicator showed five minutes to the hour. A door opened and Stewart reappeared, his face flushed and of staring eye.

"Five minutes. In five minutes I shall speak to the world. In five minutes I shall tell them the story of Vera. All the world will know." His lips twitched. "All the world will know. Ah! and they'll never forget." His voice rose to a scream.

"Steady, sir, steady!" Bob did not like the look of things. There was something about the old man which made him think that proud reason was already tottering on its throne. The effort and endeavor of the past three years combined with his brooding sorrow had been too much.

Two minutes to go. One minute. The silence indicator snapped into a red glow, the televisor was working.

Jason Stewart scrambled up to the instrument and stared at the all-seeing eye. Ten million people were watching him, were listening to the wheezy gasp from his lips. The second indicator clicked and Stewart cleared his throat.

"Peoples of the world, to-day, at this very minute, traffic is synchronized. You know what it means. You know what it can do. Therefore I will not elaborate. Instead I wish to tell you a story." His voice shook a little. "Three years ago, I had a daughter, as many of you have daughters. She was all I had. She was killed, killed by some sportsman driver, while she was tending the injured at the wayside. She was killed by traffic—man-driven traffic.

"Since then I have worked, I and the lad who might have been my son. We have worked together, day and night, to make traffic safe. At this instant a million new cars are on the road, controlled not with the clumsy murderous hand of man, but by the infallible power of science—of mathematics. They are safe, your daughters are safe. My God . . ." Stewart paused for breath.

Williams, standing just aside, thought he would have fallen.

"Take it easy, sir," he suggested in a whisper.

Stewart glanced at him and made some adjustment on the table. What was he doing?

Bob Williams stared. A switch, a small, simple, black switch in bakelite. Probably only a bell or some signal.

Mechanically, Williams' eye followed the switch down and saw a long trailing wire passing along the side of the room. It was simple enough, it must be some sort of indicator.

Stewart went on: "Pardon me, peoples of the world, but I am an old man. Today I feel it more than ever." Suddenly he laughed. "If I had a daughter I might feel better, peoples of the world, but you and your traffic took her away from me. Look what I have given you in return! Safety for yourselves, safety for your daughters. D'you think I'm a fool, yes, an old fool?" He grew rigid. "The safety of your traffic depends on my photo-zones. The wave length of the infra-red beams in 66.3 microns. You will not understand it. You only care for maddening speed, for traffic, for mad traffic, for murderous traffic. In your hearts you don't care whether it is safe or not. Safe! Listen, in ten seconds I shall blot out the safety zones all over the world. You can hear me, but you have no time to act. In ten seconds I cut off those safety zones. You shall remember my daughter. The traffic of the world has ten seconds to live!"

Suddenly truth burst upon Bob Williams and he flung himself at the old man, but the strength of a maniac Stewart thrust him away. They closed. Again Williams seized him round the arms, but Stewart's first caught him in the throat and he crashed to the floor striking his head. Before unconsciousness claimed him, he saw Stewart deliberately depress the little switch and almost simultaneously a roar burst from the Strand below.

Driven at a dizzy speed all the photo controlled cars were suddenly deprived of their guiding power. In the fraction of a second, where all had been order, was confusion, chaos, death. The streets of London, New York, the cities of all the world were in that moment converted into a shambles. Literally the pavements ran with blood.

In that moment Jason Stewart had revenge.

* * * * *

Once again sounded the bugles and the crimson pillar in Remembrance Square faded gradually to a peaceful green. The multitude stirred uneasily, lingered a few minutes longer and then stragged away in awkward groups to their homes or occupations. Only the old man remained behind on this, his last pilgrimage.

THE END

DISCUSSIONS

In this department we shall discuss every month topics of interest to readers. The editors invite correspondence on all subjects directly or indirectly related to the stories appearing in this magazine. In case a special personal reply is required, a nominal fee of 25c to cover time and postage is required.

Common Sense vs. Optimism—A Letter of Excellent Criticism

Editor, AMAZING STORIES:

Thanks for "squashing" Mr. Rawson, whose letter appeared in the May issue of AMAZING STORIES. His remarks about Poe, Wells, etc. made me indignant and it did me good to see your opinion was the same as mine. Although the so eloquent Mr. Rawson may have already read what he terms "a waste of valuable space," myself and all the newer readers have not. As A. S. is becoming more popular every month, it is probable that the majority of the present readers have not read "those old stories." If many letters like the one I have mentioned come in, with its talk of nightmares and phony excuses, you certainly have a lot to put up with.

I shall sympathize with you once more, then start criticizing your magazine. It really is too bad that you cannot express your thoughts about space-flying without being so severely criticized. My common sense agrees with you about such stories as "Triplanetary," but my optimism is up in arms.

The cover on the May issue is, however, much better than any yet, so much better that I scarcely recognized the magazine. The present size is convenient and makes the magazine easier to hold while reading. I might suggest smooth edges to the pages. After all, what does the format matter, anyway?

Having defended the reprints, I should praise them. "The Diamond Lens" was fine and so was the story (I forgot what the title was) of the clockmaker that thought he could create life much better. I liked seeing the "Gold Bug" in our magazine, although I had read it before; it was like meeting an old friend. Continue the reprints, they rest one's mind after the stress and strain of ultra-space, sub-ether, inertia-less matter, green emanation, red heat-rays, blue disintegration rays—and pink elephants. At one time I liked interplanetary stories, but now there is so little story and so much ray, wave, new kinds of ether and vile forms of life, that they all leave the same impression: confusion. "Terror Out of Space" started out fine, but in the end it deteriorated until it followed the same old formula as all the others. By this time, the indignant reader will have gathered that I did not particularly like "Triplanetary" or "When the Universe Shrank." In spite of my aversion to waves and rays, I liked "The Ultra-Gamma Wave," because it had only one wave and the reader did not get mixed up.

I thoroughly enjoyed "The Lost City," but it was a shameful trick of the author's to break off just when "Things Began to Happen." Talking of breaking off, the piece pulled out of the middle of "Dr. Grimshaw's Sanitarium" prevented an excellent story from becoming wellnigh perfect. In spite of the preponderance of those old spoilers 'ultra, super, sub, wave and ray,' the Jameson stories have me cheering for them. Even if they have their faults, they are so unusual and interesting in plot that they simply refuse to be ruined. "The Lost Language" was a wonderful story. Mr. Wolheim's letter on the subject was also interesting. "The Regenerative Wonder" and "The Death Protozoan" were two very good stories. I think that the time travelling idea is getting somewhat outworn, unless it is used simply as the instrument for telling a more interesting narration. This was done in "The Mentanicals" and in "Time's Mausoleum" to a certain extent. "The Theft of the Washington Monument" and "The Time Jumpers" were just undiluted time-travelling and as a result were not nearly as good as the first two. There was one humorous time-travelling story that I believe was called "The Island." That I found very interesting and amusing. Why not get the author to write a sequel to it? "The Supermen" might have been fairly good when the author first got the idea, but he completely ruined it for me by writing it in diary form. Two other stories that were outstandingly well written and interesting were "Cat's Eye" and "Peril Among the Drivers," Readers interested in the latter story might find the book "Insect Behaviour" by Cheeseman excellent reading.

I have just one more suggestion to offer. (I know that you must be tired of suggestions, but how are you to know what we readers want and don't want unless we tell you?) AMAZING STORIES could be made more interesting to people who can only get it occasionally if only one serial were given each month and the rest of the fiction space were devoted to short stories. In this way there would be more variety in each copy of A. S. Well, I have gassed long enough, so I'll close with a request for letters to me from any readers of that wonderful magazine AMAZING STORIES.

Donald E. Bunyan,
Box 1072,
Nelson B. C.,
Canada.

(We sometimes feel as if the short letters require the longest acknowledgements. Such a

letter as the present one indicates throughout careful thought and a refreshing optimism. The two reprints which you mention, the latter one by Jules Verne, deserve all the praise you give them. We could not pretend to say how many times your Editor has read the "Gold Bug." It was as fresh as ever when we were preparing it for the magazine. In first class work there is an indefinable something, that makes it possible for one to read it over and over again. One of the highest class magazines of the day has from its inception been quite devoted to reprints of old favorites. We do not ask authors to write sequels because our present stock of stories awaiting publication is not sufficiently depleted.—EDITOR.)

Reprints of Verne and Poe Objected To—A Tribute to "The Lost City"—A Good Word for Morey

Editor, AMAZING STORIES:

This letter is my small contribution to the reprint controversy. Old stories are okay as a rule; I say "as a rule" because of my antagonisim for those Verne and Poe classics which every so often appear between your covers. Cannot the Editor see that neither Verne nor Poe are wanted; they are good—but out-of-date What we reprint advocates wants are *rare* old tales, such as "The Blind Spot"; and not stories which are known and studied by children at school. Practically every book shelf contains Poe's works; and Verne, while not so popular, is still encountered at every turn. So, I beg of you, please cease such useless reprinting and devote the valuable space thus wasted to worthwhile masterpieces.

But to more congenial subjects! The June AMAZING, all considered, was a good issue. Milton R. Peril furnished many thrills and gave us much science in "The Lost City". That's what I like about science fiction—it gives dry, abstract science a "different" twist which makes it easy to understand; it's remarkably like taking sugar-coated medicine.

What do your readers expect Morey to be—a Rembrant? He's doing his best.

Well . . . To AMAZING STORIES; Long may she "wave"!

Earl Perry,
Box 265,
Rockdale, Texas

(There is a point in publishing Poe's stories at the present time. The one hundred and twenty-fifth anniversary of his birthday has been recently celebrated and this makes his stories very timely. They are so very good that they will stand several readings. You speak of every book shelf containing the works of Jules Verne. One of our correspondents says that he cannot get them, that he thinks Jules Verne's works are out of print. Your comparison is a little hard on natural science. If we only get deep enough into it, our knowledge and understanding of it will be the best sugar-coating, but don't call natural science medicine, as there is a lot of enjoyment in its study.—EDITOR.)

The Jules Verne Monument on the May Cover—Notes on "The Metal Doom"

Editor, AMAZING STORIES:

Just a line to let you know that I received the February and March issue of AMAZING STORIES on the 25th of April. Also I wish to congratulate you on the new publication of the May issue. The frontispiece portraying Jules Verne's immortality is certainly a masterpiece.

The stories seem quite different from what they used to be a few years ago, but, however, one must be content and take life as it comes. I shall not comment on any of the stories, as, if one has a mind and uses it, in a manner, one can learn and know how to like all stories that are published in your AMAZING STORIES MAGAZINE.

I like to read and re-read your magazine over and over again, then one seems to live with the story, actually to be part of it, to become engrossed in it is my ideal. "The Metal Doom" of two years ago was a story that all nations should have read, as it may sound like fiction, but one day it will be an actual happening. Yes—"The Metal Doom" is possible and the after effect would make people realize that life is really worth living and to take everything as it comes whether good or bad, and to be content with little as "what shall it profit a man if he should gain the whole world and lose his own soul?" Some day I'll write an article for the Discussions, but not at present.

John Dudley Dixon,
Radium Hot Springs, B. C.
Canada.

(Jules Verne was born in Nantes. There his monument, shown on the cover of our May issue, is erected. He eventually made his home in Amiens, celebrated for its wonderful Gothic cathedral, and there is his tomb with his monument. You speak of re-reading our magazine. We hear from many correspondents that they read the same story over and over again, so you are really in line with many others. You promise us an article for the Discussions. This letter is really a very nice little article in itself.—EDITOR.)

Sorry to Lose You—We Do Not Recollect the "Crack" You Refer To

Editor, AMAZING STORIES:

I haven't time nor inclination to enter into the merits of your reprinting policy but it seemed unfair to me that you used your columnar comeback to criticise the literary judgment of one of your critics, who like myself, has a library card and can use it, and who was merely audacious enough to say that he was buying the A. S. for new stories. One more crack like that from you and I'm off A. S. for life.

Russell E. Farrell,
Box 650, Bremerton, Wash.

(This letter needs no answer. The author is perfectly well able to take care of himself. We are sure that he will reconsider his threat of not looking at AMAZING STORIES again for the remainder of his life.—EDITOR.)

A Delightful and Well-Put Letter from an Eleven-Year-Old Girl

Editor, AMAZING STORIES:

Congratulations on the May issue! The stories from cover to cover were wonderful!

Maybe I shouldn't speak out that way, being only eleven years old, and a girl at that, but I couldn't restrain a prolonged shout of joy, beginning with the blue and cream cover (which was swell) and lasting to the very advertisements.

The story "Dr. Grimshaw's Sanitarium" was the cream of the crop, but the cream was not confined to one story. "The Lost City" was all I could wish for. Hope it keeps up as good. "The White Dwarf," "Ultra-Gamma Wave"—in short a perfect issue (as far as I'm concerned). To more scientific-minded people, who are always looking for flaws, it may not have been.

I have a word for the "kickers" which seem to be so profuse in the Discussions columns. You kickers never try to better the issue; you yell about this and that, but do we hear any helpful comments? I mean really helpful ones? No! You that want the edges cut even. Do you ever stop to think that you have a perfectly good pair of scissors which might be put to useful purpose? I'm afraid I use too much authority—but—they give me a pain in that part of the body which connects the head with the rest!

Here's hoping I can see my name in print the next time Dad buys a swell, all around magazine. (He never misses an issue.)

Eleanor Jones,
3623—34 W.,
Seattle, Washington.

(This letter gives us special pleasure as it is the composition of a girl eleven years old, which is a charming period in the life of that interesting being whom we term woman. The work of the Editor of such a magazine as ours is extremely interesting, but we could let it attack the editorial nerves if we took the "kickers" you speak of, too seriously. A little appreciation is most welcome, especially when it comes from such as you are, we mean in age and sex. It is quite a triumph to have both old and young in the one family appreciate AMAZING STORIES.—EDITOR.)

Notes on the Old and New Format of AMAZING STORIES—A Plea for Well-Known Authors

Editor, AMAZING STORIES:

Well, here I am again. I don't mean to use up so much space in your Discussions, but I have some criticisms and questions to offer.

First, I much prefer the old type of covers, although your new covers are improving. I also like the old print and type.

I saw in another magazine a discussion on the color of space. One person maintained that it was black, but another said that it was dark purple. Can you tell us which is correct?

Lately there have been articles in various magazines and papers about the new telescope which is being constructed for the California Institute of Technology. The mirror will be 200 inches in diameter. How large would a body need to be, if it was absolutely black or nearly so, to be seen on the moon with this new telescope?

If anyone would like to correspond with me by mail on science and science-fiction, I will be glad to discuss anything which I can by letter.

Mr. Editor, I have a terrible statement to make. Since I started reading AMAZING STORIES in 1930, I think that science-fiction in general is getting worse. Not AMAZING STORIES in particular; I think that AMAZING STORIES is still the best magazine published. But some others are getting worse each month. If it weren't for the few veteran authors who contribute stories, it would be a low grade science-fiction magazine. But I hope that they will cease having new and amateur authors that don't compare with the veterans. Of course, if a new author's stories are good, then I approve of printing them. Let us hope that this slump in the value of s. f. stories will soon be over (*ditto* the depression).

Well, now that I have stopped slinging brickbats, I will say that good old (8 years) AMAZING STORIES tops them all. Keep up the good work.

Harold Garrett,
1320 East 7th Street,
Sedalia, Missouri.

(We cannot predict what will be the smallest object that the great telescope with its 200-inch mirror will show. Science-fiction should not run down, because science proper is always developing something new, while topics of the authors of purely fictional stories would seem to have been exhausted years ago. Space is black. We thank you for your concluding sentence.—EDITOR.)

Interesting Remarks on Serial Stories—Jules Verne's Stories—Our Best Authors Considered

Editor, AMAZING STORIES:

It's rather hard for me to make up my mind whether I like the new format of the magazine or not. It was rather a blow to me when I first saw the reduced size. I always liked the receding title; and, too, the larger magazine seemed to possess more wordage. However, when I think of the fact that so far the covers have been 100% perfect, in contrast to many of the older magazine covers, and the magazine itself much better bound, I think the new format is almost as good. Particularly I like the idea

of more than one serial in a magazine. A story written up to book length always seems to me to be better written than the short story, possibly because there is always the chance that a long story will be made into a book, while the short story lives only a short while; consequently the author spends more time and art on the longer one. Now I see that you have three serials, and with me that registers o. k. I thought I had either read or knew the titles of all of Verne's fantastics, but "Measuring a Meridian" is one I never heard of. It's good. I wonder if you couldn't reprint "Hector Servadac, or The Chase of the Golden Meteor." One of the readers stated that it was probably his best work in that line. Contrary to many opinions, it is practically impossible to secure *any* of Verne's work. I believe they are out of print.

For many years I had pronounced the name Jules Verne the way it was spelt, but then I discovered Jules was pronounced 'Jool'. Perhaps many of your readers have been fooled similarly. And while on the subject of pronunciation, I have been pronouncing 'Martian' the way it is spelt, but on reflection discovered that it probably is pronounced 'Marshian'. Am I right in both these counts? Whether right or wrong, I will have a hard time breaking my habit of mis-pronouncing in both cases.

Your best author, and I am in accordance with most of your readers, is Dr. Edward Elmer Smith. "Triplanetary" was fine, but somehow did not hit the level set by "Spacehounds". It is strange about Dr. Smith. No, no, don't print his picture, I may be disappointed. It is rather terrible the way you treat Dr. Keller, with only three stories in a year. Of the bunch, he is the only real literateur. It is doubly strange you do not print more of his stories, as I have a fancy that AMAZING STORIES editorial chair also favors Keller above the others. Is it true stories of his have been translated into foreign languages?

Many years ago, Dr. Breuer, author of another story that should have had more applause than it got, namely "Paradise and Iron," wrote a letter to Discussions mentioning a scrapbook of outstanding stories culled from AMAZING STORIES. Wouldn't it be a good idea to let him name them for our perusal? He also puts the literary touch to some of his stories. In fact, I used to class Keller and Breuer together. Think it over. Breuer is a good judge of stories. Sometimes you disappoint me. In past years you have continually remarked on the fact that you were over supplied with too many good stories to even consider reprints. Then in addition to giving us a host of many very poor stories, you had to follow it up with reprints of Edgar Allan Poe. I can get them, without exception, at the public library. Besides, reprinting stories with a literary taste to them will not bring our magazine anywhere near the *Atlantic Monthly*, as you half jokingly remarked in Discussions. What you've got to do is to print unpublished stories that will rival Poe's (what's more, sometimes you've done it—witness "No More Tomorrows," "Omega the Man," "The Mentanicals," and even "Dr. Grimshaw's Sanitarium" which I liked very well—perhaps I shouldn't have mentioned this last as it doesn't quite leave the land of harum-scarum for the land of 'that indefinable something'.)

In spite of all my criticisms, I'm with you to the end. With the advent of three serials and a good story like "Terror Out of Space," my enthusiasm is running almost on the top line of our enthusiasm chart, only at infrequent, but sudden, intervals sagging all the way to the zero line, only to pop right up again. Get more from E. E. Smith *right away!* Get Keller busy! Make Stephen Hale, author of "The Laughing Death" and "Worlds Adrift" a staff writer! Keep three serials! Get more Charles Tanner—am waiting impatiently for his serial. With Forest Ackerman—keep Discussions up-to-date!!!

Paul Cahendon,
322 W. 4th St.,
Cincinnati, Ohio

(We really thank you for liking the covers. We can assure you that a great deal of thought is expended on them and the artist has every motive to make them good with a view to his progress in art in the future. Serials are a bone of contention. Some like them and some do not, but we really think that you put the thing about right in taking the ground that the long story is apt to be a more solid piece of literature than the short one. The second pronunciations which you give are correct. We will not attempt to describe anybody's cast of countenance so we will leave Dr. Smith to your imagination. As you may imagine, he is quite an impressive looking personality. We have many real literateurs. We are giving now one of Dr. Keller's best stories which puts him high in that class. We are rather amused at your wanting three serials, when a number of our correspondents object to any.—EDITOR.)

A Letter About Reprints

Editor, AMAZING STORIES:

I am writing to let you know my ideas upon the subject of reprints.

During the last few months you have been giving us reprints, mainly of Poe's works. Now, as you remember, one of your chief arguments against reprints was that they were obtainable in public libraries. This is incorrect at least so far as the section in which I live is concerned. I have never found any science fiction except one or two stories by Verne. But of all the science fiction that you could reprint, Poe's are the only ones which are present in practically every library. And also, I do not consider Poe's tales, although they are very fine, as science fiction.

You are now running a serial by Jules Verne. This is all right, and I believe I will enjoy reading it, but I think that in publishing it you are more or less evading the issue. I do not think the reprints you are giving us are the ones that are wanted by those who desired this class of stories. In my opinion they wanted stories like "Treasures of Tantalus," "The Skylark of Space," "Station X," etc. I could list many more but these are representative of the type I think your readers want.

Roy F. Phillips,
700 Jefferson St.,
Martins Ferry, Ohio.

(If you ever read Poe's story called "Three Wednesdays in a Week" you would find it a model of a science fiction story with a definitely humorous touch in Poe's inimitable manner. The story entitled "Measuring a Meridian" is one which will stand very careful reading. However, we will have to let the subject of reprints go for the present. We have some very good stories awaiting publication, which are not reprints.—EDITOR.)

The Jules Verne Monument Cover—Reprints Not Favored—A Letter from a Lady

Editor, AMAZING STORIES:

Although I have been a constant reader of AMAZING STORIES for years, in fact since its inception, I have never written in before. I am writing now mainly for two reasons.

First, let me congratulate you on your May cover—it is absolutely the best looking cover I've ever seen on any Sf. magazine, and should be the answer to every Science Fiction reader's prayers. Why not print some with no printing on to be framed?—I'll buy one.

Second, I want to register my protest against reprints, and such reprints as Poe and Verne. Any one at all interested in S.f. has probably read them. I know I read them years ago, and if I felt like reading them again, all I would have to do is walk a couple of blocks to the nearest public library. If you must have reprints, why not some that aren't so well known? Otherwise I have no complaints to make. I enjoy the magazine as a whole very much.

Thanking you for many hours of pleasant recreation,

Mrs. Elizabeth Hicks,
580-15th Avenue,
San Francisco, Calif.

(This correspondent says, "I have never written in before." As she is a lady, that alone is a good reason from our standpoint that she should write again. We want letters from her charming and highly interesting sex. As far as we have ascertained, Verne's story, "Measuring a Meridian," which would tempt any Editor of a science fiction magazine on account of its information about the measurement, has been read by very few of our readers. We have had one letter, which you will probably see, where the writer says he cannot get any of Jules Verne's books. We will repeat in closing, that we hope to hear from you again.—EDITOR.)

Riding the Editor—(He Wishes More Would Do It, If They Do as Well as This Correspondent Does)

Editor, AMAZING STORIES:

Jules Verne's monument looks good on the cover, thanks to Morey's masterful touch.

I like the way you are making up the Contents Page now.

"Terror Out of Space" ends good and the new serial starts out good. Winstead, M.D., F. Pratt and J. Lewis Burtt have good contributions in this issue too. Why are you putting two serials in now? I think one is enough.

I seem to have gotten the Editor into no little bit of trouble over his answer to a question of mine regarding the possibility of a trip to the moon. But the Editor should be quite immune to all kinds of brickbatz and slams by this time. Anyway, I'm glad we all don't feel the way he does about it. It's too bad we can't live long enough to find he's been wrong. Anyway, the Editor has a nice editorial in this number. Maybe he will forgive me for riding him after this compliment.

Olon F. Wiggins,
2418 Stout Street.
Denver, Colorado.

(Many people think that two serials are correct, some even like three. The Editor, as you suggest, is somewhat immune to attack, but not perfectly so, and when attacked it is a great pleasure to be able to confute the attacker as he has done this very day out of Webster's Unabridged. We also fail to see anything personal or offensive in conflicting views about trips to the moon.—EDITOR.)

A Letter of Excellent Criticism from a Careful Reader

Editor, AMAZING STORIES:

Would like to enter this letter in "Discussions" if ye would be so kind. I will admit I have a knock, or two, to thrust down thine honorable throat.

It seems passing strange to me that an Editor should be so persistently against the thought of interplanetary travel, especially in the light of past and present discovery. I wonder if it could be professional jealousy of some sort. I have noticed, that in a great many cases, learned men have denounced strenuously the strange and new as false and impossible. Why is this trait so pronounced in mankind? Let us hear from the editor and see what he has to say. David H. Keller should have a chance at this, as a psychologist, to express his opinion on the subject of *"Doubt."*

The story "The Terror Out of Space," in one way, could be considered excellent; but in another, very dull. It is good as far as charac-

ter portrayal is concerned, but the story is weak when it comes to giving the readers something new.

"The Lost City" is fair; but the author must have a sadistic mind, at one point anyway, when he remarks on the humor of Cheops. Maybe there were a couple of Cheops and I'm thinking of another. If it was the one that built the great pyramid in Egypt, then his humor was very touching . . . on a lot of people, if you understand what I mean. I'll let it pass without any further remarks. Hope Peril doesn't feel hurt.

Cut down on the number of serials to two at the most in one issue. If there are a lot of them on hand, why not print them in a Quarterly. You could get rid of eight short novels in a year in this manner; two in each Quarterly. The Monthly could handle about seven others during a year. Fifteen in all.

Would like to hear from anyone who is inclined to write; and if anyone is interested in finding out interesting things about authors, drop me a line and I'll see what I can do.

If, by this time, the Editor feels I have let him down, I will say I have a complete file of all AMAZING STORIES since the first, and am looking forward to the tenth birthday of this patriarch of Science Fiction with no little anticipation.

Kenneth B. Pritchard,
82 Second Street,
Pittsfield, Mass.

(You need not be afraid of knocking an Editor, that poor individual spends his life in an atmosphere of knocks. You speak of something seeming "passing strange" to you. Man's efforts to rise from the surface of the earth become very messy when he reaches ten miles of elevation and the moon is, in round numbers, twenty-four hundred times as far away as this. Such figures as this should take out any element of personality which curiously enough some correspondents put into their judgment of our views on space.—EDITOR.)

A Valuable Letter from a Young Reader

Editor, AMAZING STORIES:

The minute my copy of the May A. S. came, I just had to sit down and write you a letter. The cover is superb; I'll bet it will double your circulation. The editorial is excellent, and of special interest to me now, as I am reading Eddington's "Expanding Universe." The stories —I'll have to give up classifying them. They're all so good that I can't decide, especially "The White Dwarf," by J. Lewis Burtt.

In your blurb for "The Lost City" you say Mr. Peril is a new author. If I remember rightly, he wrote "Dynasty of Blue-Black Rays" in 1930. Are you going to run three serials regularly? I notice one is a reprint. Keep this up. Some you could publish are "Explorers Into Infinity," "Fire People," and "Man on the Meteor," by Ray Cummings, "Blind Spot," by Flint & Hall, "Out of the Moon," by Flint, "Ship of Ishtar" and "Seven Footprints to Satan," by Merritt, and "On the Brink of 2000," by Garret Smith. These are now practically unobtainable, and I'm sure we readers would like them. What stories have you selected for the next quarterly? Is it a reprint?

Below, I've listed the best story you've published each year (1926 to 1934):

1926—Second Deluge
1927—Moon Pool
1928—Skylark of Space
1929—Into the Green Prism
1930—Skylark Three
1931—Stone from the Green Star
1932—Swordsman of Sarvon
1933—Into the Hydrosphere
1934—Triplanetary (so far)

Quarterly:

1928—Sunken World
1929—After 12,000 Years
1930—Paradise & Iron
1931—Islands of Space
1932—Voice Across the Years
1933—Man from Tó-morrow

Where are: Williamson, Hamilton, Meek, Harris, Starlz, Cloukey and Schachner. The last named is, in my opinion, one of the best science fiction authors.

How about a forecast of next month's stories, at the end of the stories, or on the last page?

Would some reader please oblige on how to bind issues? I would appreciate this, as I have now about 85 A. S., making up about all you have published, which I would like to bind.

I notice a letter from John Russell Fearn in Discussions; have you any stories by him on hand?

On the whole, I believe your mag. has reached a new high, surpassing the very high standard you set in 1932. There is one fault, however, the uneven edges. With these, the mag. tears easily. I hope you remedy this as I think most readers want them cut even.

I realize that this is rather a lengthy letter, but I hope you will print it, as I enjoy seeing my name in print.

William H. Kennedy, Jr.,
31 Wellesley Park,
Dorchester, Mass.

(Your list of stories is most interesting for us, taking us back so many years. We give a forecast of the next month's stories when we can find room for it. We have two stories by Fearn on hand. We certainly appreciate your flattering judgement of the success of our efforts.—EDITOR.)

More About Reprints—How to Select Them

Editor, AMAZING STORIES:

This must be the umpteenth letter you've received requesting reprints. Now, when I say reprints I don't mean the moth-eaten archaic stories by Poe, Verne and Wells that you've been dishing up to us lately (one can almost

smell the odor of mothballs about them) but the interesting, really entertaining stories taken from early issues of 'Argosy,' 'Science and Invention' and our own magazine. Certainly it would be just as easy and convenient to use these as the ones you are now using. Some of the old favorites I think would make good reprints are "The Blind Spot," "The Nth Man," "The Moon of Doom," "The Mad Planet," "The Red Dust," "The Runaway Skyscraper," "The Green Splotches" and "The Ark of the Covenant." To my mind the above represent some of the finest science fiction ever printed and beat Poe's and Verne's stuff all hollow. I don't suppose you'd ever think of doing it, but if you wanted a way to increase circulation figures, why not reprint A. Merritt's greatest story, "The Metal Emperor," which ran serially in Science and Invention! You know, I'm fairly spoiling for a chance to read that story.

Now for a few comments on recent issues of A. S. The new serial by Doctor E. E. Smith is better than average, but in my opinion it's pretty far below his usual standard. I guess the pace he set in the Skylark stories and Spacehounds was a bit too hot to keep up. Still I got a tremendous kick out of the battle between earth's superspaceship and the Nevian vessel as described in the third installment of "Triplanetary". They say Hamilton is without a peer as a writer of space battles, but take my word for it, he can't hold a candle to Smith in this department. "Peril Among the Drivers" was an excellent adventure novelette by Bob Olsen. I thoroughly enjoyed every line of it. I suppose it was a sort of sequel to "The Ant with a Human Soul". Victor Endersby's story, "A Job of Blending" was pretty good but was much, much too short as was "The Man Who Stopped the Earth". The new serial by H. Haverstock Hill, who is really J. M. Walsh, an English novelist, is just fair. Rather mediocre, run-of-the-mill stock, I'd call it. "A Descent into the Maelstrom", by Edgar Allen Poe was terrible. It was only about the fifteenth time I'd come across it in different books and magazines.

In closing let me say that I am in the market for back issues of AMAZING STORIES from 1930 back to the beginning. Anyone having such to sell at a fair price please get in touch with me.

ROBERT TUFTS,
61 Rathbun Ave.,
White Plains, N. Y.

(It is well to specify numbers in some cases. We receive so many letters about the contents of AMAZING STORIES that we do not know what to do to please everybody, and this is a task for a Napoleon. The proverb says, "Please yourself and you will please one person." The trouble with an Editor is that he has to please a multitude of people, yet has to please himself in a sense. This is because unless he does good work he will be displeased within himself, yet he runs the chance of not pleasing his readers. So you see the Editor is really between two fires in wanting to do what impresses one as right and also in wishing to publish what his readers will like. You are a little too hasty in your criticism of such distinguished authors as the ones you name. H. G. Wells is a very live writer to-day. Edgar Allan Poe is world-famous. It is curious that while you object to the reprint, "A Decent Into the Malestrom", you say it has been reprinted about fifteen times already. Does not this indicate that at least fifteen Editors have agreed with us? It is a long time since we published a story by Wells. In 1927 and 1928 we gave a number of them and we consider that they were well received. None has been published in recent years. Within a few weeks George Bernard Shaw has pronounced Poe the greatest American author. We are glad to publish your request about back issues. You might address our Circulation Manager who may be able to supply your needs.—EDITOR.)

A Letter of Complaint—But Others Like What You Object To

Editor, AMAZING STORIES:

This is for the Discussions Columns. Anyway lets get away from formalities of letter openings. This is a letter of protest so there is no use beating around the bush. First of all I wish to protest loudly about the printing of Edgar Allen Poe's stories in our mag. There is nothing worth while in the way of science in them. You are always commenting upon the fact to your readers that you are over-stocked with stories. Do you mean Poe's stories? If you insist on his stories why not publish another magazine containing his complete works. Oh well, maybe by the time this letter is printed (if it is) you will have gotten over your mania for Poe stories. I would like to see in the Discussions Columns the opinion of some of the other readers of your magazine on this subject.

I heartily agree with another reader when he says that since you have joined the NRA why not raise the price a little and then maybe we could have smooth edges. By the way the other reader I refer to lives in this same town. I shall have to meet him.

There seems to be a great amount of controversy on this subject of reprints. I think you told some of your readers that you were thinking favorably of giving us some of your former stories. I have not seen any yet. I notice around this town that a good many of the people have very little interest in science. Whenever I try to tell my friends anything scientific they class me as an idiot or something. However there is one fellow that will listen to me without laughing. I try to interest some of the rest of them but they just don't like it I guess. By the way what has happened

to John W. Campbell, Jr. He is a fine writer, but I don't see him anymore. Maybe I am wrong but it seems to me that the magazine is declining in the last two issues. See if you can't come up a bit.

Why does it take the letters so long to get in the Discussion Columns. Because there are so many? Why not have one issue devoted to letters or perhaps one half an issue would be enough.

G. Hunter,
604 Preston Road,
Morgantown, W. Va.

(This letter is a good example of what we may almost call scolding. You speak of us taking a long while sometimes to get in letters. Many of them however, are published in very good time. You suggest that we should raise the price a little. What we are working for is to increase the circulation so that we will feel authorized to introduce various improvements. You are mistaken if you have any idea that the magazine is declining for it definitely is not. We are certain also that our readers would not like having an issue of the magazine devoted to letters or even half an issue devoted thereto.—EDITOR.)

Back Numbers To Be Disposed Of for Foreign Postage Stamps

Editor, AMAZING STORIES:

From time to time there have been letters from foreign readers asking where they could obtain back copies of AMAZING STORIES. I have quite a number of back issues extending as far back as 1926 and 1927. I would be willing to exchange these for postage stamps of their respective countries. Although foreign readers are in a better position than readers in the U. S. A., I will answer all letters, regardless of their origin.

Edwin Rothouse,
4713 N. 9th Street,
Philadelphia, Pa.

Copies of AMAZING STORIES for Sale, with Covers

Editor, AMAZING STORIES:

I wish to offer for sale, the following issues of AMAZING STORIES. With covers—January, February, March, May, October and November, 1933. January and April, 1934. Price twenty-five cents. Without covers—July and December, 1932. April, June, July and August-September, 1933. Price fifteen cents.

Watson Fulks,
Route 2,
Conway, Arkansas.

AMAZING STORIES of the Last Three and a Half Years for Sale—Notes on Stories

Editor, AMAZING STORIES:

Noticing in your Discussions column letters requesting choice back issues of "our" magazine, I am sending this letter in the hopes that you will publish it in the Discussions Columns. I have a number of much wanted issues such as a complete set of Edward E. Smith's stories, "Spacehounds of I. P. C." and "Skylark Three," not to mention plenty of others, as I have been reading your "mag." for three and a half years, both the Monthly and Quarterly. Unfortunately circumstances necessitate my disposing of quite a sizeable pile of magazines. Some of your stories have been of such high merit that I have read a number of them as many as four or five times. Some of these are "Invaders from the Infinite" and the other Arcot Wade and Morey yarns. "When the Dark Star Passed," "The Stone from the Green Star," "A Modern Prometheus," "Television Hill" and so on *ad infinitum.* I just went upstairs to look up the name of a story and I came across "Invaders from the Infinite" and "Skylark Three." Well so long while I bury my nose in the doings of Arcot, Wade and Morey. Hoping to see this letter in your magazine, I am

Robert Wilde,
3821 N. Darien Street,
Philadelphia, Pa.

(Your list of good stories is quite interesting and is enlightening for us in letting us know what authors do the work which pleases our readers. There are quite a number of letters in which correspondents tell of having issues for sale and some of these will certainly meet with customers and we hope the same will come to you.—EDITOR.)

A Canadian Correspondent Asks About the "Ways of the Moon"

Editor, AMAZING STORIES:

Your stories have always appealed to me and so you may imagine my surprise and pleasure when I saw AMAZING STORIES reappear in December on Canadian newsstands. I have not missed a copy since. The two serials were both great stories and well written, but "The Lost City" promises to excel both of these. The short stories are very interesting and cover a great deal of ground.

In "The Man Who Stopped the Earth" by Henry Kostkos, the moon streaked off from the earth at a tangent when the earth was stopped. If the earth was stopped would it still not retain its influence on the moon and still cause it to circle around it? However, it is only a detail in a good story.

Wishing you all the success—

John O'Connell,
Glanford Avenue,
Victoria, B. C.,
Canada.

(Our magazine now is published in Canada so you will have no trouble hereafter in purchasing it. We will leave your question about the story by Mr. Kostkos to be answered by him. Canada is not very far away from this part of the world, but it is another country and we are glad to get a little touch of the cosmic effect, meaning readers all over the world in our magazine.—EDITOR.)

The Fall 1934

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